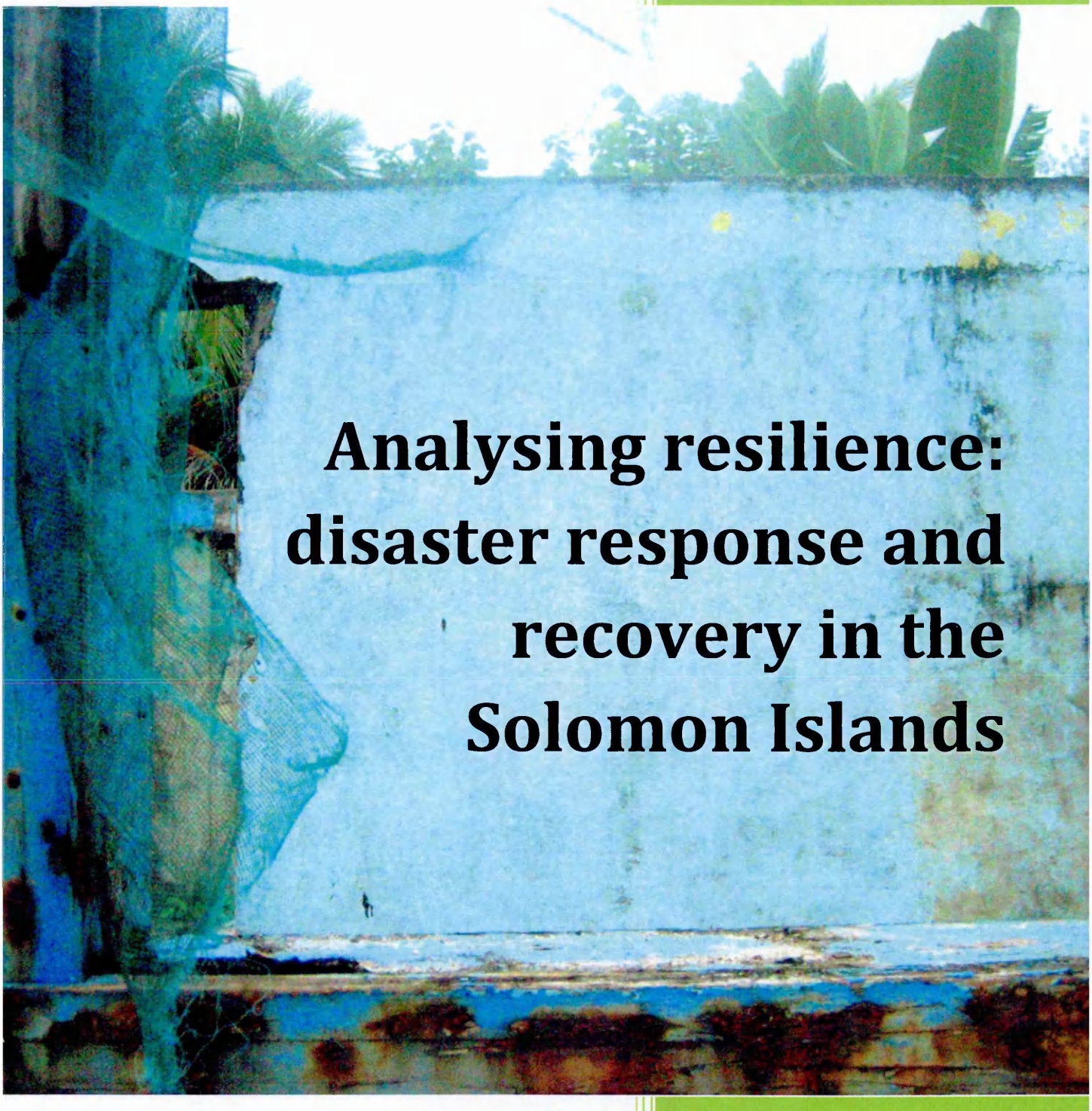
Analysing Resilience: Disaster Response and Recovery in the Solomon Islands

Thesis



Analysing resilience: disaster response and recovery in the Solomon Islands

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The photo on the previous page shows the remains of a house in Niu Manra which was largely destroyed by the 2 April 2007 Solomon Islands tsunami.

'Seek higher ground': children from Nusa Baruka advise on what to do in case of a tsunami

Abstract

In April 2007 an earthquake with a magnitude of 8.1 occurred in the Solomon Islands. Within minutes tsunami waves hit several islands, causing death and destruction. This thesis examines how four ethnically diverse communities on Ghizo Island responded to and recovered from these disastrous events. Referred to as processes of disaster management, response and recovery are analysed with the aim of providing insight into community resilience to the 2007 disasters and into changes in the communities' indicators of disaster resilience in the aftermath of the events. By doing so, this thesis addresses the following research question: 'In the aftermath of the 2007 Solomon Islands earthquake and tsunamis, how have disaster management processes informed community resilience?'.

This thesis makes three main claims. First, when looking at the reaction and coping mechanisms of the affected communities, the Melanesian inhabitants of Ghizo were more resilient than the Gilbertese communities who migrated to the Solomon Islands in the mid-20th century. The relative strength of the diversity of their culturally-embedded livelihood activities played a prominent role in this. Second, it shows that although humanitarian aid should be largely concerned with a timely and efficient delivery of emergency items, the local context should play a prominent role in the design and execution of aid interventions aimed at recovery. Failing to do so may negatively impact affected communities' socio-cultural long-term recovery. This introduces the third claim: affected communities' indicators of resilience change in a post-disaster setting. Actively initiated changes in cultural practices with the aim of increasing resilience are part of this, as well as the long-term decline in intra-community cohesion related to conflict over aid. This thesis demonstrates how research in the aftermath of disasters can provide valuable information on resilience and cultural change, related to both the physical event and subsequent aid interventions.

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AusAID	Australian Agency for International Development
CIA	Central Intelligence Agency
HFA	Hyogo Framework for Action
IFRC	International Federation of Red Cross
JICA	Japan International Cooperation Agency
LDC	Least Developed Country
MEF	Malaita Eagles Force
NGO	Non-Governmental Organisation
NDC	National Disaster Council
NDMO	National Disaster Management Office
NGDC	National Geophysical Data Center
NZAID	New Zealand's International Aid and Development Agency
NMSS	Niu Manra Site Sea
NMT	Niu Manra Top
NOAA	National Oceanic and Atmospheric Administration
NRC	National Research Council
PIC	Pacific Island Countries
SIDS	Small Island Developing States
SINBS	Solomon Islands National Bureau of Statistics
SOPAC	Applied Geoscience and Technology Division of Secretariat of the Pacific Community
UN	United Nations
UNISDR	United Nations International Strategy for Disaster Reduction
UNOHCHR	United Nations Office of the High Commissioner for Human Rights

USGS	United States Geological Survey
WHO	World Health Organisation

Glossary

This list presents definitions of important terms as used in this thesis.

Capacity
The availability of, access to, and use of resources to anticipate, cope with, or recover from disaster.

Change
An alteration in an affected population's state or direction of social, economic, political, and environmental conditions that deviates from pre-disaster conditions, and which is substantial in terms of the ways it influences people's lives.

Community
A group of people who are linked by a sense of cohesion.

Community cohesion
A feeling based on a shared history, a notion of identity, set (cultural) values and norms, similar position in society, means of livelihood, sharing resources, looking after and standing up for each other, equal rights and opportunities, and linked social ties of trust, care, and control.

Conflict
A disagreement between two or more members of a social entity which arises when the beliefs or actions of some of the members are seen as incompatible and resisted by the other members.

Coping mechanisms
Strategies of survival for dealing with the immediate disastrous impacts of a hazard or hazards.

Culture
A shared set of meanings, values, ways of life, and practices that are transmitted through learning and that govern behaviour and beliefs. Culture is dynamic and fluid, and can be shared by people belonging to different ethnic groups.

Disaster subculture
Those subcultural patterns operative in a given area which are geared towards the solution of problems arising from the awareness of some form of almost periodic disaster threat.

Ethnicity
The classification of individuals in terms of their most basic identify, referring to social relationships within a group that are not a cultural property of that group.

Humanitarian aid
Aid with a dominant focus on immediate relief, safety, security, health and wellbeing.

Power
A complex strategic situation in a given social setting, enabling possibilities for action for some whilst constraining this for others. It is present in the everyday, socialised and embodied relations between groups and/or individuals.

Recovery
All processes contributing to overcoming disaster and recreating a normal state of living, one that is accepted by the disaster-affected community. This can, but does not necessarily, imply a return to the community's previous conditions of functioning; it can also imply the creation of a new level of functioning.

Resilience
The capacity of a society to deal with and overcome the damage brought by the occurrence of natural hazards in order to obtain an acceptable and satisfactory standard of living, whether this implies a return to the pre-disaster social fabric or through accepting change.

Response
The (community's) capacity to limit and deal with the immediate disastrous impacts of a hazard. It refers to the first phase of disaster management and encompasses two stages: the immediate, initial reaction to the first signs of the hazards, and the subsequent coping strategies.

Vulnerability
The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a society to the impact of hazards.

Acknowledgements

I would like to thank the Open University and the British Geological Survey for providing me with the opportunity to carry out this research. I feel privileged to have been given this opportunity. To all my supervisors (Professor Nigel Clark, Dr David Humphreys, Professor Michael Petterson, and Dr Susanne Sargeant, who were there at the start, Dr Melissa Butcher, who joined this journey at a later stage, and Dr JC Gaillard as an informal supervisor): thank you for all your advice, ideas and direction- it has also brought me a lot and I like to think it has made this research stronger. I would also like to thank fellow PhD colleagues for their support.

My fieldwork on Ghizo would have been impossible without the families from Nusa Baruka, Niu Manra, Pailongge and surrounding villages, and Saegeraghi who welcomed me into their lives. A special thanks to Julienne, Teresa, Mita and Ruta: you have taught me so much in a variety of ways and I truly value all the moments I spent with you. Stay true to who you are. Also, a warm thanks to Patti Duke for always providing me with a place to stay in Honiara.

Finally, to my dearest family and friends, near and far. Your support, in so many ways, made all the difference.

Chapter 1

Introduction

A disastrous event caused by a natural hazard knows no man-made borders. It does not distinguish between race and religion and it does not choose whom it harms and who it leaves untouched. Yet one such event can affect groups of people inhabiting the same area in very different ways; the disastrous impacts can differ tremendously, both over the short-term and the long-term. Research into how affected communities respond to and recover from disaster can provide valuable information on the causes of such differences. It can contribute to a knowledgebase that provides insight into resilience to the events experienced and into post-event changes that may shape resilience to future disaster (Aldrich 2012, Bird et al. 2011, Birkmann 2010). Driven by this line of reasoning, this thesis presents the story of the people of Ghizo, Solomon Islands.

On 2 April 2007, at 07:39 AM local time (April 1 2007, 20:39 UTC), the morning rituals of the inhabitants of the Solomon Islands' Choiseul and Western province were disturbed by a submarine earthquake with a magnitude of 8.1. The shallow earthquake's epicentre was 45 kilometres south-south-east of Ghizo Island (USGS 2007), a small island in the Western Province, causing severe damage to this island. However, tsunami waves with run-up heights of up to twelve meters (National Geophysical Data Center (NGDC) n.d.) that hit Ghizo and surrounding islands within five minutes after the earthquake occurred caused even greater damage and loss of life (see Figure 1). Fifty-two people died, of which 33 were from Ghizo Island. Two of the fatalities on Ghizo were people belonging to the Melanesian ethnic majority group and thirty-one belonged to the Gilbertese minority group (McAdoo et al. 2009). This disproportionately high number of casualties amongst the ethnic minority group generates questions on the resilience of the Gilbertese people in relation to their Melanesian counterparts. As the PhD studentship that

granted me the opportunity to do fieldwork in the Solomon Islands was advertised as a project in geography but focusing on geological hazards, the 2007 earthquake and tsunami stroke me as noteworthy and relevant events to research a possible connection between ethnicity and disaster resilience. This thesis therefore examines the response and recovery of the Melanesian and Gilbertese ethnic groups on Ghizo to the 2 April 2007 Solomon Islands earthquake and tsunami.[1] It uses resilience as a concept guiding and framing the interdisciplinary research and analysis presented in the chapters to come.

Figure 1 Tsunami destruction on Ghizo Island
(Source: Roger Wheatley, AusAID)

In this introductory chapter the rationale for the research on which this thesis is based is explained in section 1.2, the research questions are introduced in section 1.3, an overview of the structure of this thesis is presented in section 1.4, and section 1.5 briefly explains how research participants' data is presented. As many terms used in this thesis are open to several interpretations it is important that they are understood in the manner intended in this context. Therefore this chapter starts by briefly describing the most important terms used throughout this

[1] These events and the ethnic make-up of Ghizo Island are discussed in more detail in Chapter 2 'The Solomon Islands: geological and socio-cultural formations'.

thesis, and as summed up in the list of acronyms. The majority of these terms are further explained and embedded in a wider context at a later point in this thesis.

1.1 Terminology

First of all, it is of foremost importance to understand how resilience is defined in this thesis. The term resilience can be interpreted in a variety of ways. In this thesis **resilience** is defined as the capacity of a society to deal with and overcome the damage brought by the occurrence of natural hazards in order to obtain an acceptable and satisfactory standard of living, whether this implies a return to the pre-disaster social fabric or through accepting change. Chapter 3 further explains the choice for this way of defining resilience by situating it in its theoretical framework. This definition includes several terms that are in turn open to various interpretations: society, natural hazards, and change. These terms, along with related terms frequently used throughout this thesis, are briefly described below.

Society refers to a group of people involved with each other on many levels; it can refer to a nation as a whole or to smaller populations or groups of people, at times called communities, within that nation. In this thesis a **community** is defined as a group of people who are linked by a sense of cohesion. As will become clear later on, the term community is used to refer to the four groups of people amongst which research was carried out, but only when referring to moments in time that these people viewed their groups as communities. They are referred to as villages when they did not regard themselves as communities. **Community cohesion** refers to a feeling based on a shared history, a notion of identity, set (cultural) values and norms, a similar position in society, means of livelihood, sharing resources, looking after and standing up for each other, equal rights and opportunities, and linked social ties of trust, care, and control. Often, but not necessarily, a community shares a geographical location (Kearns and Forrest 2000).

Natural hazards are defined as potentially damaging physical events that may cause the loss of life, injury, property damage, social and economic disruption or environmental degradation (United Nations International Strategy for Disaster Reduction (UNISDR) 2004). They are events that are naturally occurring. Some natural hazards are geological in nature, such as earthquakes caused by the movement of the earth's tectonic plates (further explained in Chapter 2). The 2 April 2007 Solomon Islands earthquake was such a tectonic earthquake and can therefore be classified as a **geological hazard**. It was also a tsunamigenic earthquake; this tsunami can therefore be seen as a secondary hazard whereas the earthquake was the primary hazard. The earthquake and tsunami are both **rapid-onset hazards**: they appeared suddenly and could not have been predicted far in advance. These are main the features that set rapid-onset hazards apart from slow-onset hazards, such as droughts. **Disasters** differ from hazards in the sense that they refer to the disrupting consequences of hazards. In this thesis disasters are viewed as the negative impacts of hazards on the functioning of a society. Disasters are a result of the complex interaction between a hazard and the propensity of a society to be adversely affected by this hazard (Birkmann 2006, Cannon 1994, Burton and White 1993).

The processes of dealing with and overcoming disaster are explained by using the terms *response* and *recovery*. These terms play a prominent role in the coming chapters. In this thesis, **response** refers to a society's capacity to limit and deal with the immediate disastrous impacts of a hazard. As will be explained at a later point, response is viewed as encompassing a society's initial reactions to the first signs of a hazard, and the subsequent **coping mechanisms**: strategies of survival to deal with the immediate disastrous impacts of the hazard. Chapter 5 will detail the role of **locally relevant knowledge** in responding to disaster: knowledge originating from various sources including local, scientific and globally-mediated knowledge, and that is relevant in dealing with disaster. **Recovery** refers to all processes contributing to overcoming disaster and recreating a normal state of living, one that is accepted by the disaster-affected community. This can, but does not necessarily imply, a return to the community's previous conditions of functioning; it can

also imply the creation of a new level of functioning. Explained in more detail at a later stage, **disaster management** refers to processes of managing the disastrous consequences of hazards. Response is seen as the first phase of disaster management, and recovery as the second phase.

1.2 Rationale for research

Research on disaster-affected societies is often preoccupied with assessing damage and losses (Birkmann 2010). Nevertheless, studying the processes of disaster management could provide knowledge which is extremely valuable in designing and executing disaster management interventions or in developing disaster risk reduction strategies for future disaster (Bird et al. 2011, Varda et al. 2009). The relevance of such research is centred on three important areas.

In the first place, it provides a greater understanding of the complexities influencing response (Bird et al. 2011, Gaillard et al. 2008). Analysing affected communities' reactions and coping mechanisms provides insight to those underlying factors influencing behaviour and decisions taken in face of a potentially disastrous hazard. Differences in such underlying factors can cause differences in response. In turn, differences in response can lead to differences in impacts (Gaillard et al. 2008: 20). Once it is understood how underlying factors shape the capacity of response it becomes clear why impacts may vary between communities inhabiting the same area and affected by the same event Therefore, analysing communities' responses provides valuable knowledge of how resilient the communities were to the disaster faced (Aldrich 2012, Birkmann 2010), and what factors influenced that resilience.

Second, analysing response aids the understanding of recovery. Communities who experience a disastrous event may gain first-hand knowledge of how their response shaped the disastrous impacts of the hazard. Disaster-affected populations are not merely dependent, inferior and subordinate, argues Bankoff (2001), but are able to learn from and adapt to the experience of a disaster (Wisner et al. 2004). This can result in changes in the affected communities' socio-cultural

fabric and ability to overcome the havoc caused by the hazard and to better prepare for future events (Birkmann 2010, Gaillard and Le Masson 2007). Hence understanding communities' responses provides valuable indicators of trajectories of recovery. In turn, analysing recovery processes provides insight into community-initiated changes to increase resilience so as to deal more effectively with future disaster.

Third, disaster management processes that are not in the first place initiated by communities themselves but that do affect the communities should be investigated. Communities' socio-cultural recovery is frequently influenced by disaster aid interventions (Christoplos 2006), and decisions made during aid interventions can have long-term implications for the affected population (Australian Emergency Management Institute 2011, Birkmann 2010, Mulligan and Shaw 2007). Variations in the ways aid interventions shape recovery can result in different patterns of recovery, including changes in the affected communities' pre-disaster[2] social fabric that can influence their resilience to future disaster.

Forming the overall rationale for the research presented in this thesis, the above discussion stresses the importance of addressing *resilience* in research on disaster management. This is emphasized not only in academia, but also in a wider context. The UNISDR's Global Platform for Disaster Risk Reduction is perhaps the most well-known example of this. The platform is a biennial forum for government representatives, UN organizations, non-governmental organisations (NGOs), scientists, and practitioners to share experiences and formulate strategic guidance and advice with regard to disaster risk reduction. At the time of writing, the fourth session of the global platform, held in May 2013, was the most recent platform focusing on the implementation of the Hyogo Framework for Action (HFA): a ten-year plan, approved in 2005, aimed at building

[2] In this thesis 'pre-disaster' refers to the period prior to the disastrous events central to the discussion. It is acknowledged that other disastrous events may have occurred prior to that.

the resilience of nations and communities to disasters.[3] At this fourth platform consensus was reached that the framework following HFA, the Sendai Framework for Disaster Risk Reduction 2015-2030, should continue to be characterised by a strong focus on resilience.

The rationale for research is further discussed when setting out the theoretical framework shaping this research, which adds depth to the information presented above by detailing how other research needs or gaps in research shaped the exact focus and rationale. In addition to this rationale for the topic of research, the rationale for the methodological approach to research must be kept in mind. Investigating community resilience in a cultural context different from that of the researcher demand calls for an approach adapted to the context of research and which respects ethical codes of conduct of that context. Taking this into consideration, the rationale for an approach informed by ethnography, and indigenous and decolonising methodologies is explained in Chapter 4.

1.3 Research questions

As discussed above, the research presented here focuses on resilience in a disaster management context. This focus came into being through a process of analysing hazard and disaster research literature, including the literature referred to in the previous section, in combination with a visit to the Solomon Islands nine weeks after starting this PhD. Additionally, my supervisors' different disciplinary backgrounds, ranging from seismology to sociology, aided shaping the focus of this interdisciplinary research.[4] Chapter 4 discusses in more detail how the first visit to the field contributed to forming the research questions guiding this research, but at this point the research questions are simply presented and briefly explained.

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[3] The Hyogo Framework for Action (HFA) came out of the World Conference on Disaster Reduction, held in Kobe, Hyogo, Japan in 2005. The United Nations describe the HFA as the first plan to explain, describe and detail the work that is required from all different sectors and actors to reduce disaster losses.

[4] This PhD project had been conceived by the supervisors involved at the start of this PhD: Prof Nigel Clark (Open University/ Lancaster University), Dr David Humphreys (Open University), Prof Michael Petterson (University of Leicester/ Secretariat of the Pacific Community), and Dr Susanne Sargeant (British Geological Survey). It was clear from the beginning that this research was to address 'community resilience in the Solomon Islands'.

The main research question for this thesis is:

In the aftermath of the 2007 Solomon Islands earthquake and tsunamis, how have disaster management processes informed community resilience?

In addressing this question, three subsidiary questions drive this thesis:

A) **How did ethnically different communities respond to the same event?**

B) **How did aid interventions influence communities' disaster management processes?**

C) **How did communities' responses and aid interventions influence long-term recovery and resilience?**

The exact location of research was Ghizo Island, adversely affected by the 2007 earthquake and tsunami. The ethnically different groups referred to in sub-question A are the Melanesian ethnic majority group and the Gilbertese ethnic minority group living on Ghizo. Research amongst Melanesian Solomon Islanders was mainly carried out in the villages of Pailongge and Saegeraghi, research amongst the Gilbertese Solomon Islanders was mainly carried out in Nusa Baruka and Niu Manra. Chapter 2 further discusses these four research locations, whilst Chapter 3 provides the rationale for carrying out research in an ethnically diverse context.

Sub-question B was formed based on data gathered throughout the first visit to the Solomon Islands, and Christoplos' (2006) observations on the aftermath of the Indian Ocean tsunami in 2004. He argues that disaster-affected communities' recovery is frequently influenced by disaster aid interventions (Christoplos 2006). Chapter 4 details how data gathered in the first field visit contributed to forming this sub-question.

Sub-question C is also largely inspired by the first field visit in combination with literature. Torry et al. (1979) argue that disasters, like any other major event, trigger short- and/or long-term transformations. More recent studies (e.g. Gaillard 2007, Mulligan and Shaw 2007) support this argument. These studies are further discussed at a later point.

1.4 Structure of the thesis

The main contribution of this thesis is to illustrate how the disaster management processes of response and recovery inform community resilience. Following this introductory chapter, the starting point for doing so is Chapter 2 'The Solomon Islands: geological and socio-cultural formations'. This chapter presents a profile of the Solomon Islands. In simple terms the chapter provides an understanding of the country's geological context, situating the occurrence of the 2007 earthquake and tsunami in this environment. The chapter continues by providing a description of the cultural setting of the Solomon Islands, directing particular attention to the exact location and people addressed in this research: four communities on Ghizo Island, two belonging to the Melanesian ethnic group and two belonging to the Gilbertese ethnic group. All four communities were profoundly affected by the 2007 events.

Chapter 3 provides the theoretical framework serving as the basis for the design of the research presented here, as well as the basis for the collection, analysis and interpretation of data. It introduces resilience by addressing the concepts of vulnerability and capacity, and addresses debates around the definition of resilience. The chapter explores theories and concepts drawn upon in operationalising resilience, particularly when addressing resilience in a disaster management context, and discusses response and recovery whilst doing so. The chapter continues by identifying and detailing the characteristics and indicators of a resilient society, which will be touched upon in the empirical chapters (chapter 5, 6, and 7). The last section of the

chapter explains how the exact scope of research was fine-tuned by discussing a focus on 'developing'[5] countries, ethnicity and change.

Chapter 4, 'Methodology and methods', outlines the methodological approach adopted during fieldwork, as well as discussing and explaining why and how certain methods were used. The chapter first discusses ethnography and indigenous and decolonising methodologies as approaches influencing the direction taken in this research. This is followed by an explanation of how these methodological approaches shaped the ways this research was carried out by placing emphasis on enabling an understanding of the socio-cultural context of research whilst paying careful attention to local ethics and enhancing knowledge exchange rather than 'extracting' knowledge in a one-way manner. The chapter next discusses and clarifies the methods used in this research, after which it presents a reflexive analysis of the fieldwork. As this chapter explains to a great extent why I as a researcher made certain choices with regard to methodology and methods, it is largely presented from a first-person point of view.

The main focus of Chapter 5 'Community disaster response' is answering sub-question A of the research questions: How did ethnically different communities respond to the same event? The first section of Chapter 5 examines the initial reactions of the Gilbertese and Melanesian communities to the 2007 earthquake and tsunami. It does so by discussing three factors influencing the ethnic groups' reactions and shaping inter-group differences in these reactions. The second part of the chapter investigates the coping mechanisms of the affected communities. In many ways it mirrors the first part of the chapter, but with a focus on how survivors coped.

[5] It is acknowledged that the terms 'developed country' and 'developing country' can be subject of extensive criticism. Like the terms 'industrial' and 'non-industrial' or 'modern' and 'traditional' these terms can be criticised for implying the superiority of certain types of nations over others. After a careful consideration of the literature it was decided to use the rather conventional terms 'developed' and 'developing' as these terms refrain from singling out a specific aspect of development (for example, using the terms 'industrial' and 'non-industrial' can give the impression of solely referring to economic development), and are used in several important hazard and disaster literatures like the Hyogo Framework for Action 2005-2015. In addition, the widespread use of these terms contributes to a general understanding of the type of country referred to. To further the understanding of particular characteristics of the Solomon Islands as a developing country, more specific terms and descriptions are used where possible.

Both parts of Chapter 5 end in a discussion on how the information presented, provides insight into the resilience of the affected communities to the 2007 events.

Chapter 6 'Uncovering local perceptions of disaster aid interventions' mainly addresses sub-question B: How did aid interventions influence communities' disaster management processes? It first discusses how survivors of the earthquake and tsunami phrased the transition from response to recovery according to the type of aid delivered. Survivors' frustrations and disapproval with the way aid interventions aimed at recovery were carried out, are discussed in terms of two thematic areas: poor coordination and collaboration between various aid organisations, and the exacerbation of pre-existing power relations in relation to aid donors' choices for personnel. The section preceding the chapter's concluding remarks discusses how survivors' perceptions of the aid interventions are related to feelings of distrust, scepticism and suspicion, eventually giving rise to conflict in each of the four communities.

Chapter 7 'Resilience and change: lessons and legacies' largely investigates sub-question C: How did communities' responses and aid interventions influence long-term recovery and resilience? It discusses and analyses how the processes addressed in chapters 5 and 6 influenced the affected communities' longer-term socio-cultural development. Chapter 7 is therefore closely linked to the two chapters preceding it; is not a free-standing empirical chapter, and has more of a discussion component than chapters 5 and 6 have. Several changes in the make-up of the affected communities are addressed as observed six years after the earthquake and tsunami hit. These changes are discussed in relation to indicators of a resilient society.

Chapter 8, 'Conclusion' builds on the findings presented in Chapter 7 by analysing how the research on disaster management processes contributed to providing insight into both past resilience and into changes made that may influence resilience to future disaster. Additionally, it analyses how aid interventions can have long-term implications for the disaster-affected

populations - changes that were likely not intended by the organisations involved in the aid interventions. Chapter 8 sheds light on the contributions to knowledge this study brings, as well as it makes recommendations for further research.

A simplified and summarized outline of this thesis is presented in Table 1, which gives an overview of the chapter titles, whilst clarifying which chapters are predominately based on the empirical research, and which sub-questions are addressed by which chapters.

Table 1 Summarized thesis outline

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<tr><td>Chapter 1: Introduction</td><td colspan="2" rowspan="4"></td></tr>
<tr><td>Chapter 2: The Solomon Islands: geological and socio-cultural formations</td></tr>
<tr><td>Chapter 3: Resilience: theories, concepts, and the focus of research</td></tr>
<tr><td>Chapter 4: Methodology and methods</td></tr>
<tr><td>Chapter 5: Community disaster response</td><td rowspan="3">Empirical chapters</td><td>Sub-question A</td></tr>
<tr><td>Chapter 6: Uncovering local perceptions of disaster aid interventions</td><td>Sub-question B</td></tr>
<tr><td>Chapter 7: Resilience and change: lessons and legacies</td><td>Sub-question C</td></tr>
<tr><td>Chapter 8: Conclusion</td><td colspan="2"></td></tr>
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1.5 Presentation of research material

The following chapters, the empirical chapters in particular, present findings obtained through primary research in the Solomon Islands. Several quotes of research participants are presented in these chapters. In the light of consent, it must be made clear that the names accompanying participants' quotes are pseudonyms. Quotes are presented in the language they were expressed in. In most cases this is Solomon Islands Pijin. Based on my understanding of Pijin I provided an English translation of these quotes. Quotes given in the English language, containing a minimum of words in Pijin or none at all, are presented in English. Photographs presented throughout this thesis are my own unless otherwise noted.

Chapter 2

The Solomon Islands: geological and socio-cultural formations

> The story of Ulawa, an island in the eastern part of the Solomon Islands, begins with the death of an old man called Poromarimatawa. Shortly before he died he asked Poromaua'ou'ou to honour his memory by holding eight great feasts, four of pigs and four of fish caught in the sea. Poromaua'ou'ou and his brother began a series of fishing expeditions. After trying their luck in the coastal waters off Small Malaita, Poromaua'ou'ou one day decided to lead the canoe fleet further out to sea. While fishing in that area Poromaua'ou'ou pulled up the island which is now called Ulawa (Sanga 1989: 17).

The opening quote of this chapter holds many references to the culture and history of the Solomon Islands. The lines are part of a story that has been told in the country for many generations; storytelling is a cultural practice not uncommon in this region with strong oral traditions. Though not factually correct, it is a reference to the geological activity characteristic to this area in which tectonic movements involve the subsidence and uplifting of islands (Nunn 2001).

With the aim of contextualising the research presented in this thesis, this chapter provides an understanding of the geological and cultural setting of the Solomon Islands. It starts by presenting a general profile of the country, which leads onto a brief exploration of its geological history in section 2.2. Next, the 2007 earthquake and tsunami, the hazards on which this research is based, are discussed. Section 2.4 details the connectedness between such geological hazards and the region's Melanesian culture, explaining how the presence of such hazards made its way into the cultural practices of the people inhabiting the region. Section 2.5 provides more insight into the

Solomon Islands' current cultural context, providing an understanding of issues referred to throughout this thesis, whereas section 2.6 sets out the specific context of research by describing the four villages in which the fieldwork underpinning this thesis took place.

2.1 Country profile

The Solomon Islands are an archipelago nation located in the South Pacific Ocean, east of Papua New Guinea and approximately 2000 km northeast of Australia (see Figure 2). It is a double chain of 992 islands, of which 350 are inhabited by approximately 0.5 million people (2009 Population and Housing Census). The majority of the population (80.3%) economically relies on subsistence-oriented farming and fishing activities (Govan et al. 2013), which is one of the classic characteristics of Small Island Developing States (SIDS). The country is one of forty SIDS (United Nations Educational, Scientific, and Cultural Organization, n.d.), which typically share similar attributes such as their small, isolated populations that mainly inhabit coastal areas and depend on natural resource-based livelihoods, less developed economies, and exposure to natural hazards and climate change that undermine their sustainable development (Gero et al. 2010, Kelman 2010, Kelman and West 2009, Méheux et al. 2007, UNISDR 2005, Pelling and Uito 2001). In relation to this, the Solomon Islands are actively involved in various global meetings and forums on climate change and disaster management.

Like most SIDS, the Solomon Islands are very isolated; they are a spread-out and rather remote collection of white sandy beaches and lush green vegetation, amidst a vast azure ocean home to a large variety of tropical fish. Photographs of the country could easily make their way into travel agents' brochures published in northern Europe's cold, dreary winter seasons: sunny islands in an isolated setting, far away from all daily troubles. Ironically, for a long time it was exactly because of the islands' isolated location that voyagers did not set foot on the Solomon Islands. In the two hundred years following 1568, the year in which an expedition initiated by the Spanish government spent six months among the islands (Mendana et al. 1901), not one of the ships sent

by Europe managed to find the isolated islands again; geographers started to doubt their existence. It was not until the second part of the eighteenth century that the islands were rediscovered by the Europeans, this time by the British. This process could not have been phrased better than the way Mendana et al. (1901: i) wrote it down in their book *The Discovery of the Solomon Islands*: 'There is surely nothing in the history of maritime discovery so strange as the story of how the Isles of Solomon were discovered, lost, and found again'. Moreover, in addition to a remarkable story on its discovery by European explorers, the remote location of the double chain of scattered islands holds much more information on the country's history.

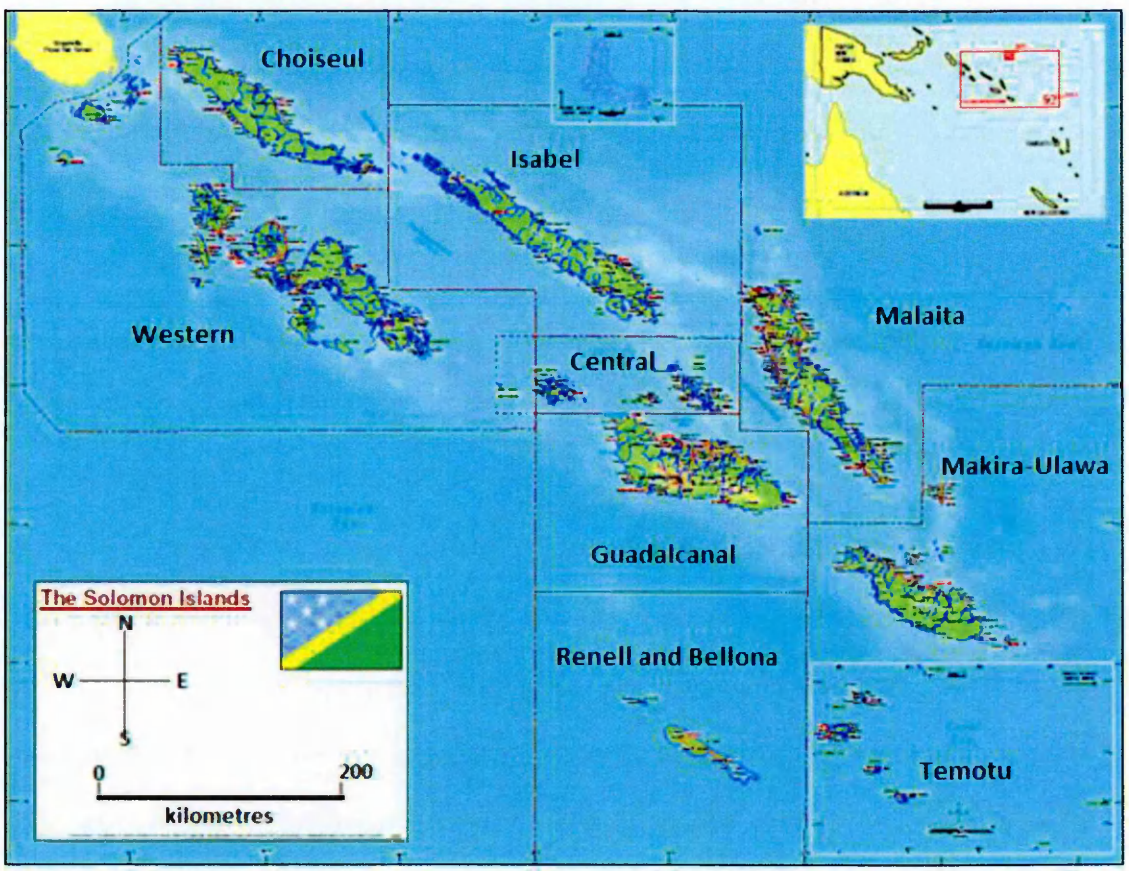


Figure 2 Map of the Solomon Islands
Provinces from East to West (position of the province names): Western, Choiseul, Isabel, Central, Guadalcanal, Rennell and Bellona, Malaita, Makira-Ulawa, and Temotu (inset). Adapted from: Solomon Islands' National Disaster Management Office (NDMO) (2007).

2.2 Chains of islands

The majority of the 992 islands are part of the Solomon archipelago, or Solomon arc: a double chain of islands aligned northwest-southeast (Neall and Trewick 2008). Such island arcs are

usually situated at the collision zones of tectonic plates. Also known as destructive plate boundaries, these zones are characterised by the process of subduction: one plate slides below the other and is forced into the partially molten area just below the overriding plate's surface crust (Rothery 2007). An island arc is built up from the surface of the overriding plate by the extrusion of magma. Destructive plate boundaries are therefore often characterised by high seismic and volcanic activity.

The Solomon arc is part of the Greater Melanesian volcanic arc, which stretches from Papua New Guinea in the east to Vanuatu in the west (Cronin et al. 2000, Petterson et al. 1999). It is situated in the Ring of Fire, a horseshoe-shaped area of intense tectonic activity around the Pacific Ocean. Large numbers of earthquakes and volcanic eruptions occur here, and the area is at high risk of tsunamis. The Greater Melanesian arc marks the collision zone between the Australian and Pacific tectonic plates. The exact geological history of the Solomon arc is complex, but it is safe to say that it involves processes of subduction between four tectonic plates: the Pacific and Australian plates and the smaller Woodlark and Solomon Sea plates (Neall and Trewick 2008, Petterson 1999) (see Figure 3). The processes of subduction occur at the floor of the two trench systems by which most of the Solomon Islands are bounded: the Vitiaz trench to the northeast, and the New Britain-San Christobal trench, also known as the South Solomon trench, to the south-west (Petterson 1999). As Figure 3 indicates, the Solomon Sea plate, the Woodlark plate, and the Australian plate are currently subducted below the Pacific plate at the destructive plate boundary south-west to the Solomon Islands (United States Geological Survey (USGS) 2008).

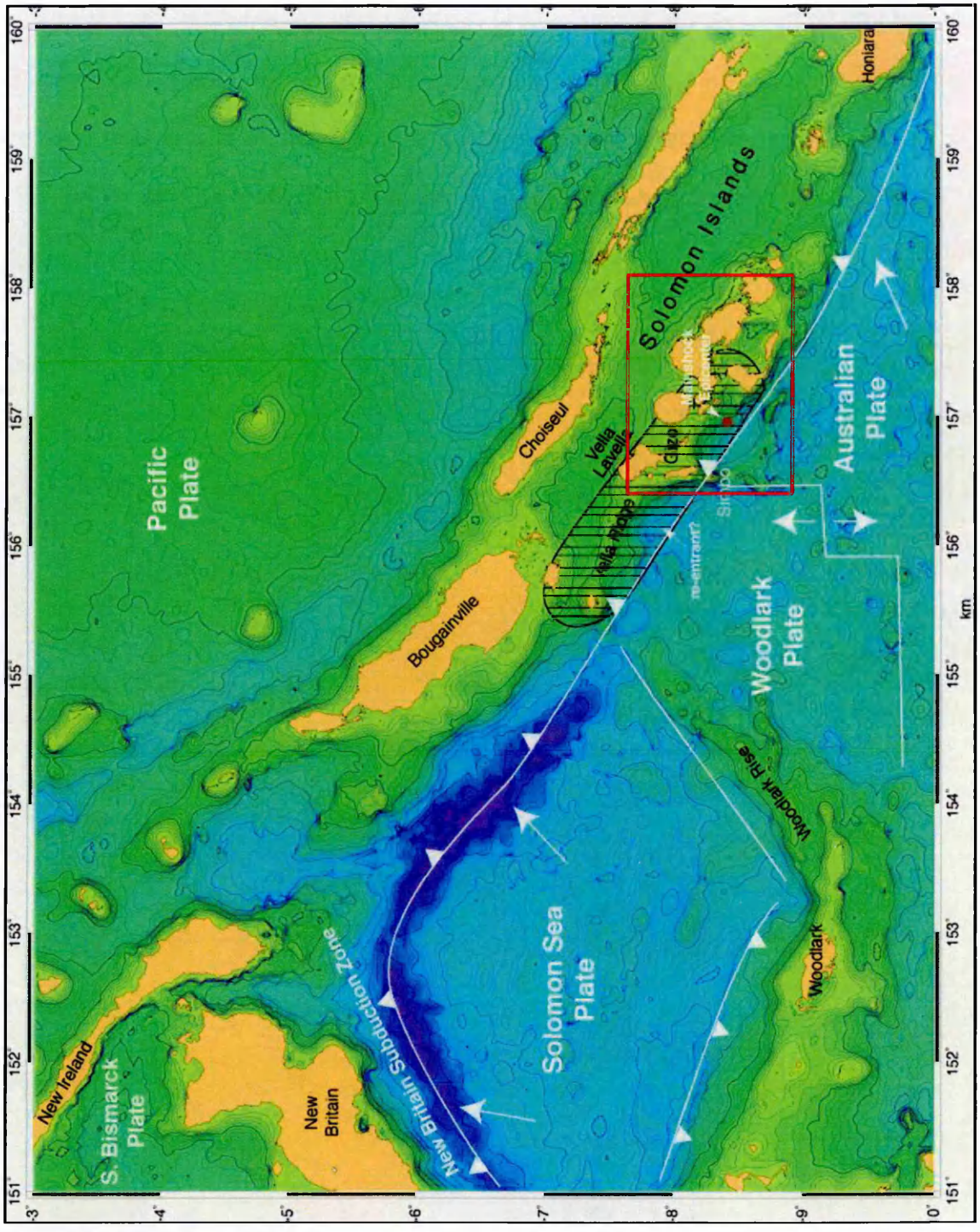


Figure 3 Tectonic setting of the Solomon Islands
The red rectangle indicates the area in Figure 5. Source: USGS (2007).

The process of subduction generates shallow seismic activity (Marshak 2008). Earthquakes occurring at a shallow depth (less than 70 km) are commonly more powerful and destructive than deep-focus earthquakes; the rock at the surface of the plates is relatively strong and it can build up more stress before releasing it in the form of heat and seismic waves than rock at greater depths (Rothery 2007). The eastern margin of the Australian plate is one of the most seismically

active areas of the world due to high rates of convergence between the Australian and Pacific plates (Benz et al. 2011). This causes high seismic activity at the destructive plate boundary south-west of the Solomon Islands (see Figure 4), at times at shallow depth. The following section on the 2007 Solomon Islands earthquake and tsunami illustrates the destructive consequences this can have.

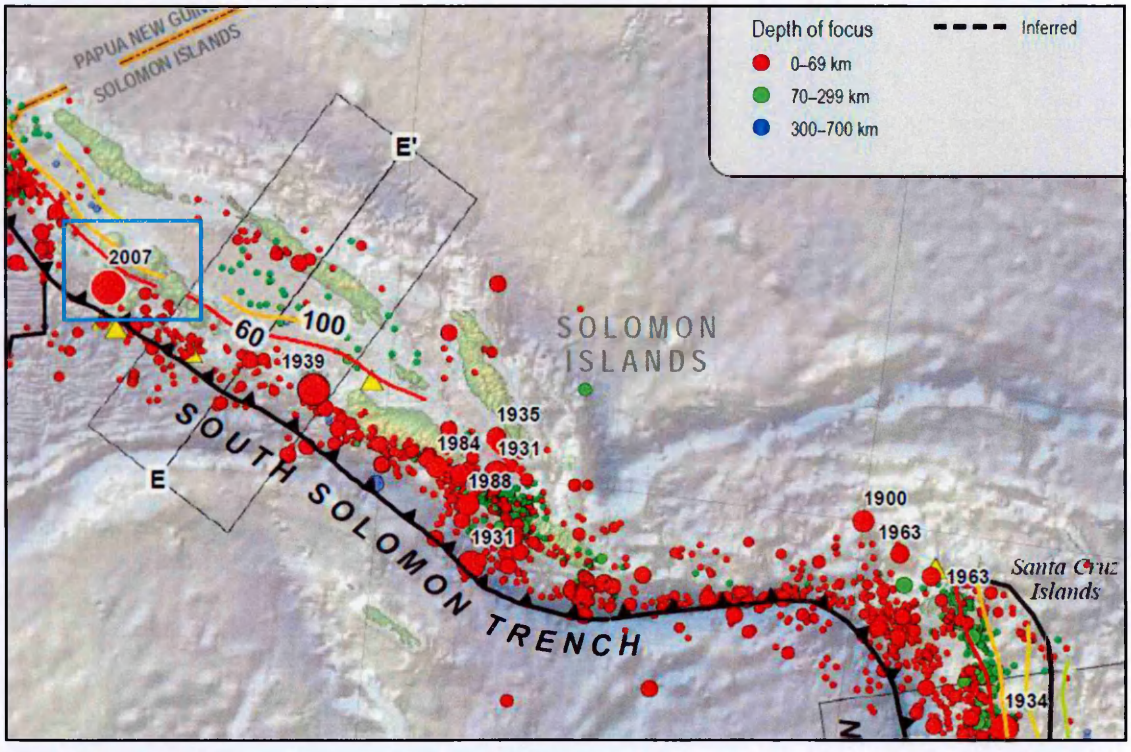


Figure 4 Earthquakes in the Solomon Islands 1900-2010
As illustrated by the legend, the earthquakes indicated by a red circle are those of shallow depth, earthquakes of intermediate depth are indicated by green circles. The absence of blue circles indicates that there are no very deep earthquakes in this area. The larger the circle, the higher the magnitude of the earthquake; the largest earthquakes are accompanied by a reference to the year in which they took place. Circles with a white ring around it are earthquakes of magnitude 8.0 or higher. The yellow triangles indicate active volcanoes. The blue rectangle indicates the area presented in Figure 5. Adapted from: Benz et al. (2011).

2.3 2007 earthquake and tsunami

The Solomon Islands earthquake of 2 April 2007 occurred at the shallow depth of ten kilometres and had a magnitude of 8.1 (USGS 2007). Despite on-going seismic activity, this was the first earthquake larger than magnitude 7.0 to hit the area since the early 20th Century (McAdoo et al. 2008). The most severe shaking was experienced on the islands of Ghizo, Ranongga, Simbo, Vela Lavela, Kolombangara, Vonavona, Rendova, and New Georgia (see Figure 5) as these were located

closest to the earthquake's epicentre (USGS 2007). The earthquake caused severe damage on these islands, and aftershocks lasting for days caused widespread fear amongst survivors.

Figure 5 The islands that experienced most severe shaking as a result of the 2 April 2007 earthquake
The yellow start indicates the earthquake's epicentre. Adapted from: Solomon Islands NDMO (2007).

Submarine earthquakes at tectonic faultlines have the capacity to alter the seabed floor. The fault motion as part of the earthquakes can cause the water above the faultline to rise, which then results in a series of tsunami waves (Rothery 2007). Tsunami waves generated by the 2 April 2007 Solomon Islands earthquake hit the islands surrounding the earthquake's epicentre within five minutes, roughly ten minutes before an official tsunami warning was issued by the Pacific Tsunami Warning Center in Hawaii at 20:55 UTC (National Oceanic and Atmospheric Administration (NOAA) n.d., NOAA 2007). Ghizo was impacted greatly. Being a hub in the Western Province it had an airport and hospital. Both were destroyed by the tsunami, as well as several villages were washed away. Further damage was caused to Ghizo's neighbouring islands Simbo, Ranongga, Vella Lavella, Choiseul, and Rendova and the Shortland Islands located about 160 kilometres north-west of Ghizo (McAdoo et al. 2008). The tsunami was responsible for fifty out of 52 fatalities (two people died in a landslide) (McAdoo et al. 2009): 33 Ghizo Island, six on Choiseul,

two on Ranongga, nine on Simbo and two on Vela Lavella (McAdoo et al. 2008). Of all affected islands Simbo is the only island not situated on the Pacific tectonic plate. Ranongga, its neighbour by eight kilometres to the north, is located on the edge of the Pacific plate (see Figure 3 and Figure 5). The uplift of the Pacific plate caused the southern side of Ranongga to be raised over three metres, whereas Simbo subsided by over one metre (McAdoo et al. 2008).

The uplift of Ranongga is a good example of how subduction processes at tectonic plate boundaries contribute to the uplift of the overriding plate and the creation of islands over time. These geological processes started long before humans inhabited the area, which only happened within the past 3000 years (Nunn 2001). The following section provides greater insight into how the geological context of the region influences the lives of its human inhabitants.

2.4 Geological hazards and Melanesian culture

The Greater Melanesian arc derives its name from the region it is situated in: Melanesia. More than a geographical region, it is a cultural region in the culturally- and ethnically-plural Pacific area; it groups together populations that share certain cultural and biological affinities (Sillitoe 1998) and that are culturally distinct from neighbouring Micronesia and Polynesia. Though enormous socio-cultural and ethnic differences complicate defining Melanesian identity as homogenous, the strong presence of oral traditions is a significant cultural feature characterising the majority of the linguistically-diverse Melanesian population. Before further addressing oral traditions as part of cultural practices, the term 'culture' deserves more explanation. Culture has been defined in a variety of ways. It is not the intention to downplay this range of literature and definitions, as its value is acknowledged and appreciated, however, to avoid misinterpretation the term culture as used in this thesis is defined in a rather short and simple manner. It is referred to as a shared set of meanings, values, ways of life, and practices that are transmitted through learning and that govern behaviour and beliefs (Kottak 2002). Culture is dynamic and fluid, and can be shared by people belonging to different ethnic groups (see section 2.6). As cultures

inhabiting geologically active areas are known for having oral histories related to geological hazards (Cashman and Cronin 2008, Nunn 2001), this aspect of the Melanesian culture should not be overlooked in studying the relation between geological hazards and the cultures inhabiting the area in which these hazards occur.

The strength of Melanesia's culture of oral traditions is demonstrated in its encounters with the written language the European missionaries tried to introduce from the mid-nineteenth century onwards. The differences and misunderstandings between the native Melanesians and the missionaries lead to violent encounters (McCane 2004) and a clash between the oral and written worlds. Even in the 1970s, an era characterised by a rise in Melanesian people writing on their culture, the written culture remained relatively isolated from the majority of the Melanesian people as authors of indigenous literature belonged mainly to a small urban elite and their writings had restricted historical agendas (Wassman 1998). Oral traditions such as myths are still strong in this region and can be seen as non-written historical records of great importance (McCane 2004, Bascom 1965).

Several stories on geological events exist in Melanesia as a whole (e.g. Nunn 2001, Blong 1982) and in the Solomon Islands in particular (e.g. Sanga 1989). Stories describing islands submerging are known from many parts of the Pacific; stories on the uplift of islands, such as the story of Ulawa, are rarer (Nunn 2001). The stories are not always factually correct and are at times more of a metaphor than a truthful reconstruction of the past, but are nevertheless often of great value in reconstructing past geo-hazards as well as providing insightful lessons on how cultures dealt with geo-hazards (Cashman and Cronin 2008, Oliver-Smith 1996).

2.5 Solomon Islands' cultural context: diversity in unity

The Solomon Islands' Melanesian population comprises the vast majority, 95.3 %, of the country's inhabitants (Central Intelligence Agency (CIA) 2013). Despite this unifying term, the Melanesian

Solomon Islanders refer to themselves as belonging to various sub-groups. This perception of identify is shaped by the region's history. Prior to the establishment of a British protectorate over the islands in the late 1890s, inhabitants of the country now known as the Solomon Islands belonged to fragmented kinship groups living on their own islands, speaking their own languages, and having their own local leaders called 'Big Men'. The colonisation of the area was the first effort ever undertaken to unify the islands (Prasad and Kausimae 2012), but the localised island-identities hindered the formation of a national identity in the Solomon Islands. An illustrative example of how the colonial rule differed from and clashed with the local politics is the fate of three policemen from the Solomon Islands. In 1927 they were instructed by the British to collect tax in a region to which they did not hold any ancestral ties, and were subsequently murdered by the local population of that region (Bennet 2002). The British largely responded to such incidents by hanging the accused. This, in combination with the gradual control the British acquired over the country and the disarming of local men, caused the violent confrontations to eventually become less common (Bennet 2002).

Under the colonial rule, Guadalcanal Island's Honiara became the country's capital city, and many people from across the Solomon Islands moved to Honiara in search of employment. When the country gained independence from Britain in 1978, dissatisfaction grew amongst the original landowning inhabitants of Guadalcanal as the number of people from Malaita, a province in the eastern part of the country, continued to increase. The situation escalated in 1998, causing what Solomon Islanders call the 'ethnic tension': a war mainly between the rivalling militias Malaita Eagles Force (MEF) and the Guadalcanal-based Isatabu Freedom Movement. It was a violent conflict over power and the right to reside in other parts of the country without having an historical connection to those areas. Although largely centred on Guadalcanal, the conflict affected relations in the country as a whole. In June 2000 the conflict took a direct toll on the state when the MEF kidnapped Prime Minister Ulufa'alu. The MEF held the opinion that Ulufa'alu had failed to adequately deal with the conflict, despite being Malaitan (Stratford 2004). The Prime

Minister was forced to resign in return for his release. In 2003 the Solomon Islands' Governor-General's request for international aid to end the conflict was met by the arrival of troops and police as part of the Regional Assistance Mission to Solomon Islands (RAMSI) - a partnership between the people and government of Solomon Islands and fifteen countries of the Pacific, led by Australia. Although the conflict officially ended in 2003, the country continues to experience tensions and unrest as many issues of power and rights remain unaddressed. Rumours and accusations still prevailed when the research presented in this thesis was carried out. The ethnic tensions mark a dark period in the Solomon Islands' history - one that testifies to the existence and manifestation of diversity amongst the Melanesian inhabitants of one nation.

Other defined population groups in the Solomon Islands are Polynesian (3%) and Micronesian (1.2%) (CIA 2013). The country's Polynesian population lives mainly on the Polynesian outliers in the south-east of the country. The Micronesian population largely migrated to the Solomon Islands from Kiribati, approximately 5200 kilometres east-northeast of Ghizo, in the twentieth century (McAdoo et al. 2009). Most came originally from Kiribati's southern islands, the Gilbert Islands. From here approximately seven hundred people had been relocated to the Phoenix Islands in the late 1930s, in an attempt to solve problems of resource scarcity and population pressure (McAdoo et al. 2009). This solution proved to be unsuccessful as the Gilbertese migrants faced droughts and fresh water shortages in the Phoenix Islands (Birk 2012). Both Kiribati and the Solomon Islands were British protectorates at the time, and the migrants were resettled in the Solomon Islands under a British Resettlement Scheme between the late-1950s and 1971 (Campbell et al. 2007, Cochrane 1970). Here they settled on various islands, mainly in territories to which they gained freehold land-rights from the United Kingdom. Within these territories they settled at the shoreline as they strongly relied on ocean-based livelihood activities.

Large numbers of Melanesian Solomon Islanders disapproved of the Gilbertese resettlement. This disapproval was largely rooted in the Gilbertese settlers' freehold land-rights to areas on Ghizo

and other islands, whilst the Melanesian population considers all of these islands theirs by *kastom*[6] (customary) law (Premdas et al. 1984), and that 'only Solomon Islanders should be resettled in the Solomon Islands' (Mason and Hereniko 1987: xiii). Premdas (1984) and Knudson (1977) state that leaders of the Western Province (to which Ghizo belongs) resented the fact that their province took the burden of Gilbertese settlement. A somewhat negative attitude towards the Gilbertese developed, and in interviews carried out as part of this research the Gilbertese stated that since their arrival in the country they feel discriminated against, both on a personal and institutional level, and that they have limited access to national services and programmes that should be equally available to all citizens of the Solomon Islands. Considering that the resettlement was not initiated by the Solomon Islanders, but by the British, and considering that the current government is largely controlled by Melanesian Solomon Islanders, it is not impossible for discrimination in the form of such power inequalities to exist, although no documented evidence of this was found. Inter-ethnic tensions between Melanesian and Gilbertese Solomon Islanders living on Ghizo have been in evidence for decades, resulting in mutual distrust and little interaction between the two groups living on the same island.[7]

It is important to keep in mind that in addition to differences between groups in a given period of time, there are also differences between and within groups that evolve over time. One of the few studies explicitly addressing how cultural characteristics in the Solomons evolve and change over time, is Fazey et al.'s (2007) 'Livelihoods and change in Kahua, Solomon Islands'. Although Kahua is located in the eastern part of the country, and the research presented in in this thesis in the western part, Fazey et al. (2007) make some observations that are equally relevant for Ghizo Island, namely the changing cultural conditions related to increased exposure to the world outside the island of research. 'Globalisation' cannot be overlooked in this context, and although globalisation can be interpreted in a variety of ways, increasingly studies of globalisation move towards the recognition that globalisation is a complex phenomenon, encompassing a variety of

[6] *Kastom*, as defined by Dinnen and Firth (2008: 114), implies traditional customs, or practices and beliefs from the past and connected to ancestors.

[7] Mixed marriages could be seen as excluded from this general statement. Section 2.6 details on this.

processes, ranging from political and economic to cultural (Tomlinson 1999), and relating to modernisation across borders. Globalisation studies have been long characterised by two standpoints: studies stating that globalisation stimulates heterogenisation of cultures (e.g. Tomlinson 1999, Appadurai 1996), and studies arguing that globalisation brings homogenisation and a loss of cultural knowledge and traditional practices (e.g. Sillitoe 1998, O'Keefe and Wisner 1975) (Mol 2000). With regard to the latter, both Fazey et al.'s (2007) work and fieldwork participants pointed to the gradual loss of *kastom* in relation to increased exposure to elements and practices traditionally external to their culture. Intergenerational tensions come into play here, as it was both observed and reinforced by research participants that older people ascribed more value to *kastom* than the younger generations did. The loss of *kastom* is particularly applicable to the cultural practices of the Gilbertese Solomon Islanders as they live as a minority group in a culturally different society. Increasingly globalisation studies reason that homogenisation and heterogenisation can occur simultaneously (e.g. Nederveen Pieterse 2009, Robertson 1992, Sillitoe 1998, Giddens 1991).

2.5.1 Wantokism

The ethnic diversity within the Solomon Islands results in many different languages being spoken within the country: a variety of languages amongst kinship groups within the Melanesian population, and the languages brought to the country by migrants. Despite the official language of the country being English, communication between the various language groups mostly takes place in Solomon Pijin. In Pijin the word *wantok*[8] is used to denote differences between island-level ethnic identities and the different languages these identity groups speak (Fukuyama 2008). Originally used in a Melanesian context, the word is currently used for both Melanesian and other population groups within the country. People of one *wantok* group are called *wantoks*, whereas *wantokism* refers to the responsibilities and codes of behaviour that exist between individuals who belong to the same *wantok* group (Lea 1993).

[8] Originally used in Melanesian Pidjin out of which Solomon Pijin developed (Jourdan and Keesin 1997), the word *wantok* comes from 'one talk' or language (Levine 1999).

In a country with a lack of strong political identities above the level of the *wantok* (Fukuyama 2008), the *wantok* system is a form of social capital on the local level. It provides a safety net; it is a system through which people within a group are protected or problems prevented. Traditionally this system is one in which the leader or Big Man of the *wantok* group is more of a trustee for the kindred than an authoritative external leader. At the same time the power associated with the *wantok* system can cause frustration and disparities between *wantok* groups when people across *wantok* groups are adversely affected by an event or series of events external to their groups. In addressing the consequences of such an event, *wantok* connections can imply that one *wantok* or a *wantok* group is advantaged over others if they have influential *wantoks*. The *wantok* system played a significant role in the (unequal) distribution of disaster aid after the 2007 tsunami (see Chapter 6).

In his article on state building in the Solomon Islands, Fukuyama (2008) suggests that the fact that Solomon Islanders at least partly see the *wantok* system as a positive source of social capital, and the fact that the *wantok* system has long been characterised by trust in local leaders, play a role in post-colonial governments failing to contemplate an advanced degree of nationalisation in the country. This lack of a sense of national identity hinders the emergence of a truly national party representing the people of the Solomon Islands. Fukuyama (2008) continues by detailing the state's poor capacity to deliver services on a local level, explaining that the country's administrative system is not clear on the division of power and responsibilities between the provincial governments (such as the Western Province in which Ghizo is located) and the provincial representation of the central government, leading to competition and a lack of cooperation between the two levels. Further complicating the presence of the state on the ground is the way members of parliament are elected, as well as the power they hold whilst they serve. They are elected via a first-past-the-post system in their constituency, which creates problems directly related to one member of parliament representing a constituency with a variety of wantok groups. Additionally, according to Fukuyama (2008) and expressed in interviews carried

out as part of this research, there is no accountability for the ways members of parliament use government funds, facilitating corruption and a lack of trust from the constituency's population (see Chapter 6). It becomes clear that the Solomon Islands face profound problems regarding the presence and influence of the state on a local level, shaped by a combination of flaws in the organisation of the administrative system, and a society segmented by *wantokism* and ethnic struggles. These problems in turn reinforce the power of, and dependency on, the safety net role associated with *wantok* groups.

2.5.2 Intra-community diversity

Diversity not only manifests itself between ethnic or *wantok* groups in the Solomon Islands. Also within communities power relations rule the everyday life. In Melanesian communities 'Big Men' were traditionally selected as leaders based on their socio-economic status, knowledge of tribal matters, and the ability to address the needs of the group (Malasa 2007). Gilbertese leadership is customarily based on the authority of elders (Borovnik 2005). In both cases it is men who carry out these roles. Both in Gilbertese and Melanesian villages, elders and community-leaders have more power and status than other community members. They are to take decisions and lead the community. Fellow community members are expected to respect the leaders or elders and not to contradict their decisions. In both ethnic groups, such community-level decision-making is traditionally a process coloured by local power relations commonly based on respect. In interviews carried out in both Gilbertese and Melanesian villages respondents claimed that these traditional ways of decision making were still largely respected throughout periods of increased foreign presence in the country (i.e. colonisation and the presence of RAMSI in relation to the ethnic tension), and that they served as positive drivers of community cohesion. Despite the presence of differences in intra community power relations, the people from the four villages claimed they had not perceived their communities to be unequal. It was largely argued that, prior to the 2007 hazards, honesty, equity, and fairness went hand in hand with the established hierarchies.

2.6 Location of research

The research presented in this thesis is carried out on Ghizo Island: the island most adversely affected by the 2007 Solomon Islands tsunami. Ghizo Island is small compared to its surrounding islands: approximately 11 kilometres long and 5 kilometres wide. Most of its coastal areas are characterised by white sandy beaches and palm trees, whereas the hilly inland areas consist of lush green tropical vegetation. Most settlements are concentrated in the coastal areas: these can be reached most easily by road or canoe. For a long time Ghizo Island has been one of the Solomon Islands' most desired places to live, attracting people from both inside and outside the country. Its desirability is explained by the fact that it is home to Gizo town[9], the capital of the Western province where the main hospital in the western part of the country is located, the province's largest market is situated, and which is accessible by plane. Small planes, arriving and departing from the airport located on a tiny island two kilometres off the coast of Gizo town, connect Ghizo to Honiara on an almost daily basis, providing easy access for tourists interested in visiting the numerous plane- and shipwrecks from World War II that are scattered around the island. Ghizo's desirability has not changed much since the 2007 earthquake and tsunami.

The current population of Ghizo Island is unknown. Data retrieved from the Solomon Islands National Bureau of Statistics (SINBS) during fieldwork in 2012 indicates an estimated population of 6678 people in 2009. Along with an annual population growth of 2.3% (SINBS, n.d.) for the Western province that would mean a population of approximately 7313 islanders in 2013. Ghizo is inhabited by both Melanesian and Gilbertese people. Whereas the Micronesian population of the country only constitutes 1.2%, the Micronesian population of Gilbertese origin on Ghizo Island is much higher, although exact percentages are unknown. The Gilbertese people remain largely segregated from their Melanesian neighbours, and there is generally little intermarriage (McAdoo et al. 2009). The small number of mixed marriages is largely between (descendants of) Gilbertese people who migrated directly to Ghizo (and therefore have freehold land-rights to areas on Ghizo)

[9] Gizo town is spelled differently from the name of the island, Ghizo, but is pronounced the same.

and Melanesian Solomon Islanders external to Ghizo. Focus groups carried out in the Gilbertese villages indicated that the access to land in other parts of the Solomon Islands plays a role in Gilbertese Solomon Islanders' choice for intermarriage, and that access to land on Ghizo influences the Melanesian Solomon Islanders' rationale for marrying Gilbertese people. The small number of mixed Gilbertese-Melanesian families on Ghizo therefore predominately consists of Gilbertese Solomon Islanders married to Melanesian Solomon Islanders who traditionally have no claims to land on Ghizo. Through marriage the latter gain access to land on Ghizo: the areas that were given to the Gilbertese. These families therefore largely live in Gilbertese villages. For unknown reasons, the Gilbertese village of Niu Manra in particular is home to relatively many mixed-families.

Niu Manra is one of the three main Gilbertese villages on the island, the other two are Nusa Baruka and Titiana. They have respective populations of 206, 216 and 366 according to the 1999 census (Solomon Islands Government 1999). There are several Melanesian villages, of which Saegeraghi and Pailongge are the main ones. Their populations were estimated at 114 and 76 (Solomon Islands Government 1999), although Pailongge serves as an umbrella village for smaller neighbouring villages (Woruku, Vankuva, Simboro, Suvania, Tikoko, Pokimundi, Kilunia, Hakaroa, Leoko, and Bimbolo) that are considered part of Pailongge; hence it could be ascribed larger population numbers. The research presented in this thesis focuses on the inhabitants of four of the abovementioned villages in particular: the Melanesian villages of Saegeraghi and Pailongge, and the Gilbertese villages of Nusa Baruka and Niu Manra (see Figure 6). Prior to the earthquake and tsunami, these four groups of people considered themselves as four communities. As will be explained and analysed in Chapter 6 and 7, this viewpoint has changed after the hazards hit: the original communities no longer view themselves as communities in the way they did before. In this thesis they will be referred to as 'communities' when addressing them in the pre-2007 hazards timeframe; they will be referred to as 'villages' when addressing them in the timeframe in

which they themselves no longer speak of 'communities'. This includes the timeframe in which this research was carried out. This distinction will be clarified in Chapter 7.

The inhabitants of Saegeraghi belong to one *wantok* group, the inhabitants of Pailongge to another. Their *wantok* groups are relatively closely related; they speak different but similar languages as both are from the same geographical area. The Gilbertese villagers all speak the same language but do not share the similar closeness as the Melanesian villages. Focus groups carried out in these Gilbertese villages indicated that Niu Manra was settled around 1956 and Nusa Baruka approximately ten years later, and that the Gilbertese living in each respective village came from different parts of Kiribati.

Figure 6 Map of Ghizo Island indicating research locations
Names of the Gilbertese villages are indicated in yellow, the names of the Melanesian villages in blue. Gizo town is indicated as a reference point. Source: adapted from: UNITAR/UNOSAT (2007).

At the time of the tsunami, all four villages were located in close proximity to the ocean. As survivors of the tsunami sought refuge at higher ground and at times still remain there, all the

villages are now spread out. They are commonly split up in two groups of people: those who returned to the seaside and those who remained on higher ground. The low-lying part of Niu Manra (its low-lying area is here referred to as Niu Manra Site Sea[10]), Pailongge, and Saegeraghi can be reached by road. Niu Manra's settlement on higher ground (here referred to as Niu Manra Top) can only be reached by foot in the wet season, and by road in the dry season when using a four wheel drive vehicle. Saegeraghi's settlement on higher ground, Mile 6, can also be reached this way. Pailongge's higher settlements can only be reached by foot. Nusa Baruka's coastal areas are most conveniently reached by canoe, but one needs to continue by foot to reach the areas on higher ground. All four villages mainly consist of leaf and semi-permanent houses, and a smaller number of permanent buildings, which are frequently churches (see Figure 7).

Figure 7 From left to right: leaf house, semi-permanent house, and permanent house
The base and walls of the semi-permanent house are made of timber, which sets it apart from the leaf house. Similar to the leaf house it often has a roof made of sago-palm leaves.

The foremost reason for choosing these exact villages as locations of research is that all were severely impacted by the tsunami and suffered from building damage and coastal flooding (United Nations Institute for Training and Research (UNITAR)/ UNITAR's Operational Satellite Application Programme 2007). A second reason for choosing these villages is the similarity between the Melanesian and Gilbertese villages' geographical characteristics (see Table 2), which could be of influence on how the hazards (the tsunami in particular) affected the villages. Choosing villages with similar characteristics enhances the comparative strength of the research. Backed by steep hills the villages of Pailongge and Niu Manra were situated relatively close to higher ground. Also, both were located directly inland from major channels in the reef which likely

[10] This part of Niu Manra is located at the seaside. In Pijin this is called *site sea*; therefore it is called Niu Manra Site Sea by its villagers.

focussed wave energy onshore (McAdoo et al. 2009). Nusa Baruka and Saegeraghi were both situated further away from higher ground, which meant that a quick escape was more difficult. Neither Nusa Baruka nor Saegeraghi had road access to Gizo town, which impeded a rapid delivery of aid. Pailongge and Niu Manra did have road access although the road was damaged by the tsunami. The main difference between the Melanesian and Gilbertese villages in terms of how their inhabitants were affected by the tsunami is that there were no casualties in the Melanesian villages. In Nusa Baruka ten people died, of which eight were children under the age of ten, in Niu Manra eight people died of which five were children (McAdoo et al. 2009). Chapter 5 analyses factors of influence on the disproportionate number of casualties.

Table 2 Differences and similarities of the villages researched

	Melanesian		Gilbertese	
	Pailongge	Saegeraghi	Niu Manra	Nusa Baruka
Far away from higher ground		X		X
Backed by steep hills	x		x	
Major channel in reef	x		x	
Road access to Gizo town	x		x	
Casualties			x	x

2.6.1 Community profile

In addition to differences in their location and physical geography, the Gilbertese and Melanesian villages vary culturally. This sub-section addresses general characteristics of the Gilbertese and Melanesian villages on Ghizo Island that play a prominent role in this thesis or aid in creating a general understanding of the field sites. In the text below ethnic identity, indigenous knowledge, livelihoods and education, *maneaba* or community house, and religion are discussed.

2.6.1.1 Ethnic identity

With regard to ethnicity, the main distinction made here is the distinction between the Micronesian Gilbertese ethnic group and the Melanesian ethnic group. Before detailing this difference, the term 'ethnicity' in relation to 'culture' (see section 2.4) should be addressed. In

this thesis, ethnicity is initially understood as a classification of individuals in terms of their most basic identity (Barth 1969). It is an aspect of relationship within a group. It is the process through which commonalities such as cultural practices are woven into a consciousness of shared identity (Young 1994); it is not a cultural property of that group. The discontinuity between ethnic groups is one of a social nature, not one of a cultural nature as ethnic groups are not by definition culturally unique; culture can be shared by multiple ethnic groups (Eriksen 2002). For example, different ethnic groups in the Solomon Islands still share certain cultural traits, such as similar livelihood strategies or having strong oral traditions. In operationalising the term ethnicity, attention must also be paid to the implications that can be associated with ethnic diversity, such as the exclusion or marginalisation of certain ethnic groups in relation to others. Care must also be taken to avoid interpreting ethnicity as 'race', which can be paired with implications of a discredited scientific racism. Additionally, race is more commonly oriented towards the categorisations of others, rather than one's own group, which implies it can be interpreted as a rather negative term of exclusion (Eriksen 2002). Whilst being careful not to draw generalisations to the Solomon Islands as a whole, it is here advocated that on Ghizo Island the differences between the Gilbertese and Melanesian groups manifest themselves more and are of greater significance for this research than most intra-Melanesian differences on this island. The separation of these two groups in everyday life is clearly seen in the separate market spaces they have at Gizo town's market; people who identify with one of the various Melanesian groups sell their produce on one side of the market, the Gilbertese on the other side.

The community profiles that inhabitants of the four villages created as part of this research showed that the villagers from Nusa Baruka and Niu Manra consider their ethnic identity in the first place to be Gilbertese. This resonates with Barth's (1969) argument that an ethnic group is defined from within, from the perspective of its members. Reasons for this, as mentioned by the Gilbertese, were the facts that they originate from the Gilbert Islands and use Gilbertese as the main language of communication. In the second place the Gilbertese considered themselves

(Western) Solomon. In Nusa Baruka's focus group this was explained as 'applying Solomon *kastom*' when interacting with Melanesian Solomon Islanders. In both Gilbertese focus groups people expressed that maintaining the Gilbertese culture was not always easy when living in a different country. Children in Nusa Baruka going to school in Gizo town, and not speaking Gilbertese at this school, can be seen as an example of this. In the Melanesian villages the inhabitants relate their identity back to the specific islands in the Solomon Islands their ancestors came from; in Saegeraghi people consider themselves as part of the (Melanesian) Igo[11] tribe and in the second place as Western Solomon, whereas the community profile from Pailongge illustrated that these villagers view their ethnic identity as (Melanesian) Solomon and belonging to Simbo Island. They speak different Melanesian languages, or dialects, which are closely related.

2.6.1.2 Knowledge

Differences in people's geographical backgrounds result in differences in knowledge held by these people. McAdoo et al. (2009) state that variations in the knowledge held by the Gilbertese and Melanesian inhabitants of Ghizo Island resulted in the disproportionately high death toll amongst the Gilbertese. The Gilbertese villages of Niu Manra and Nusa Baruka were established in the 1950s and 1960s, when the migrants from Kiribati settled in the Solomon Islands (McAdoo et al. 2009). Unlike the Solomon Islands, Kiribati is not located near a subduction zone. Although the country has experienced tsunamis, these were not preceded by earthquakes near enough to be felt. This resulted in an absence of knowledge of tectonic earthquakes amongst the Gilbertese, argue McAdoo et al. (2009). Since the villages of Niu Manra and Nusa Baruka were established, there have not been tsunamigenic earthquakes in the Solomon Islands until the 2007 earthquake and tsunami; this implies an absence of opportunities to gain first-hand knowledge of such events. How differences in locally relevant knowledge of hazards influenced Ghizo's villagers' reactions will primarily be touched upon in Chapter 5.

[11] In Saegeraghi there was no mutual consensus on whether their culture was called Igo, Ingo, or Sigo. What was agreed on by the villagers of Saegeraghi is that their culture is original to Ghizo, and that all families are able to trace their family-line back to the same woman, said to be the great-grandmother of the youngest generations living in Saegeraghi.

2.6.1.3 Livelihoods and education

Similar to the Solomon Islands, the Gilbertese's native Kiribati is surrounded by vast amounts of ocean. This in combination with poor soil quality in most of the country (Thomas 2003) makes it unsurprising that the people from Kiribati traditionally have a very strong reliance upon the ocean for their livelihood. When arriving on Ghizo, the Gilbertese migrants settled along the coastline to have easy access to the ocean. Fishing remained the main way of providing food, and fish is eaten in a variety of ways: fried, smoked or raw. The latter is largely regarded with disapproval by their Melanesian neighbours. In return, the Gilbertese frowned upon the Melanesian Solomon Islanders' consumption of wild foods harvested from the bush. In combination with gardening (mainly carried out on government-owned land on higher ground), wild fruits and vegetables are equally parts of the Melanesian Solomon Islanders' diet as fish is. Most of the produce is traded at the market in Gizo town. Apart from the Gilbertese selling fish at the market, and the Melanesian Solomon Islanders selling produce from their gardens, copra (the dried meat of coconuts, from which coconut oil is extracted) is frequently sold when the demand, and therefore the price, is high. To a small extent handicrafts are income-generating products for both groups. A small number of people are employed externally, mainly as teachers, policemen, or shop-assistants. Community profiles created by the villagers indicated that the percentage of people employed externally is less than 10% in all villages except Pailongge, where the inhabitants estimated this at about 30%. Culturally different livelihoods will be addressed in chapters 5, 6, and 7 in relation to the villagers' responses to and recovery from the tsunami

Most children, though not all, attend primary school, and many of them start secondary school but do not complete it. None of the villages in which the research was carried out have a functioning primary or secondary school. Most school-going children from Nusa Baruka attend schools in Gizo town (see Figure 6), Niu Manra's children go mostly to the Gilbertese village of Titiana (located in between Niu Manra and Pailongge), and children from Pailongge at times go to Titiana, but largely go to the Melanesian village of Nari (located in between Pailongge and

Saegeraghi). Also the children from Saegeraghi go to school in Nari. As children have to go to other locations to attend school, parents have no control over whether the children actually go to school or just hang out somewhere else. Children's dropping out of school is mentioned as a problem by parents in all four villages. In the Gilbertese villages it was added that the government discriminates against children with a Gilbertese name when it comes to further education, and that children are therefore not motivated to finish secondary school.

2.6.1.4 Maneaba

Another significant difference which will be referred to throughout this thesis is the importance of a *maneaba* in the Gilbertese villages. The *maneaba*, a community house present in every village, plays a strong role in the Kiribati culture. It is not merely the largest building in a village; it is the centre of community life and it is the basis of Kiribati identity (Borovnik 2005). It is the place where a community gathers, where elders uphold Kiribati cultural norms and values, take decisions on the community, resolve conflicts, and seek justice. It embodies the whole of the community, and decisions taken in the *maneaba* must be respected by all community members. The individual is, in that sense, subordinate to the community (Sofield 2002). How the intra-community relations, as addressed in 2.5.2, are expressed in Gilbertese communities is therefore commonly heavily entwined with the *maneaba* as an institution.

When the Gilbertese settled on Ghizo one *maneaba* was built in every Gilbertese village. Traditionally the Melanesian villages do not have *maneabas* although nowadays also in the Melanesian villages on Ghizo Island the word *maneaba* is at times used to refer to spaces where a community gathers. The tsunami triggered great changes in the role the *maneaba* plays in the Gilbertese villages. This will be investigated in Chapter 7.

2.6.1.5 Religion

With over 95% of its population identifying themselves as Christian, Christianity is by far the largest religion in the Solomon Islands (CIA 2013). In each of the villages in which fieldwork was carried out at least four of the following Christian religions or religious groups are represented: Anglican, Catholic, Christian Fellowship Church (Protestant), Jehovah's Witness, London Missionary Society (Protestant), Methodist (Protestant), Seventh Day Adventists (Protestant), Society of the Sacred Cross (Anglican), and United Church (former Methodist). In addition the Baha'i faith is represented in the two Gilbertese villages. Focus groups held in the villages indicated that the majority of the people in Saegeraghi, Pailongge, and Niu Manra belong to the United Church denomination, whereas in Nusa Baruka the United Church is preceded in numbers by the Catholic Church. All villages have a United Church building. Despite Catholicism being the largest religion in Nusa Baruka, the village does not have a Catholic church; Catholic people wanting to attend church have to take a canoe to Gizo town. Some smaller religious groups have a church, but most followers of these groups carry out services in their own homes, or at times go to Gizo town. Considering the size of the villages, the diversity of religious groups represented means that at times only one or two families in a village belong to a particular religious group. Religion influences every aspect of the daily life, and churches play a very large role in shaping people's behaviour. Considering the importance of religion, focus groups addressed whether research participants perceived natural hazards to be acts of God or related to powers of higher deities. The main opinion in Nusa Baruka's focus group was that the tsunami was a natural phenomenon, not linked to religion or God. The vast majority of participants of Niu Manra's, Pailongge's, and Saegeraghi's focus groups considered the tsunami as 'an act of God'. The general reasoning behind this was that because of sinfulness in the world, the world is punished with events such as natural hazards. The role religion plays in the villages is referred to at various point throughout this thesis.

2.7 Summary

This largely descriptive chapter provided a brief understanding of the cultural and geological setting of the Solomon Islands. A profile of the country was presented by illustrating its geological and cultural context, whilst paying special attention to the 2007 earthquake and tsunami and the groups impacted by these events. In particular, the populations of the four villages in which the research took place, were described: the Melanesian Solomon Islanders belonging to the villages of Saegeraghi and Pailongge, and the Gilbertese Solomon Islanders living in Niu Manra and Nusa Baruka. The aim was to generate a basic cultural understanding essential to understanding the information presented in the empirical chapters.

The next chapter provides this thesis's theoretical and conceptual framework. Like the current chapter it has the function of embedding the research presented into its context, only is it not the physical and cultural context that is addressed in the next chapter, but the theoretical context. The focus of research will be explained and clarified, along with the interpretation of concepts of importance used throughout this thesis.

Chapter 3

Resilience: theories, concepts, and the focus of research

This chapter provides a theoretical framework serving as the basis for the design of the research presented here, as well as for the collection, analysis and interpretation of research data. It explores theories and concepts utilised in the understanding of resilience, particularly with regard to addressing resilience in a disaster management context. In addition, by detailing specific gaps in the literature and research needs, the focus of the research presented here is explained and clarified. As a whole, this chapter also serves as a conceptual framework, and the choice for and frequent use of certain concepts are explained in this chapter.

The chapter starts by exploring how resilience came to be a concept widely used in hazard and disaster studies. Section 3.1 analyses how the evolution of thinking in hazard and disaster research addressed vulnerability, capacity and agency, and paved the way for the rise of resilience as a concept. Section 3.2 further explores resilience and offers an understanding of issues around defining resilience. It addresses the rationale behind the definition of resilience as used in this thesis, whereas section 3.3 takes a closer look at resilience in a disaster management context. It is explained how the concepts of response and recovery were used to study how the four affected communities dealt with and overcame disaster. By providing a framework for researching community resilience in a disaster management context, section 3.4 presents an overview of characteristics of a disaster-resilient community. Section 3.5 illustrates how three areas of gaps in the literature shaped the focus of the research: the shortage of studies on impacts of disaster on a community level in SIDS, the importance of research on disaster management processes in an ethnically varied environment, and welcoming the notion of change in studying resilience. This chapter's conclusion is presented in 3.6.

3.1 The social side of disaster: changing foci over time

In order to fully grasp the nature and implications of resilience as a theoretical and conceptual framework structuring this research, it is important to understand the circumstances that led to the use of resilience as a concept in hazard and disaster studies. Developing such an understanding starts by looking into the debates around vulnerability which encouraged hazard and disaster research to focus more on the human side of disaster. Evolving out of the social sciences, the concept of vulnerability emerged in hazard and disaster literature in the 1970s (Gaillard 2010, Birkmann 2006, Wisner et al. 2004). The introduction of the concept meant a significant change in hazard and disaster research, which until that time was characterised by the so-called paradigm of the extreme (Gaillard et al. 2009, Hewitt 1983). This paradigm viewed natural hazards and their disastrous impacts on societies as unpredictable and extreme happenings, and considered the causes of disasters to lie outside the normal and everyday functioning of societies (Gaillard et al. 2009). Rather than focussing equally on social, economic, cultural, and political factors, physical hazard and disaster research concentrated predominantly on technologically-oriented solutions to problems caused by natural hazards (White and Haas 1975). Likewise, the social sciences were characterised by a narrow viewpoint; as disasters were considered as extreme happenings, these events were not taken into account in studies on social and cultural aspects of populations (Oliver-Smith 1996, Oliver-Smith and Hofmann 1999, Wisner et al. 2004).

In the 1970s it became clear that the paradigm of the extreme's objective to reduce the number of disasters worldwide largely failed (Gaillard et al. 2009). A sharp increase in the number of disasters between the first and the second half of the twentieth century indicated that the technologically-oriented measures aimed at preventing disaster largely failed in reaching their goal (Gaillard et al. 2009). This triggered the realisation that disasters are not uniquely natural or technological in nature, but that the disastrous outcomes of natural hazards co-depend on populations' abilities to cope with the impacts of the hazards (Birkmann 2006, Cannon 1994,

Burton and White 1993). The insight that disasters are a product of complex interactions between a potentially destructive event and the conditions of a society determined by human behaviour, led quantitative physical hazard and disaster research to focus more on social factors (Donovan 2010a, Wisner et al. 1994, Burton and White 1993), and studies carried out in the social sciences to increasingly incorporate physical hazards (Oliver-Smith and Hofmann 1999, Oliver-Smith 1996). Hazard-oriented prediction strategies based on technical interventions started to be challenged by adopting the social sciences' concept of vulnerability as a starting point for reducing societies' risk to natural hazards (Birkmann 2006). The use of vulnerability as a concept in hazard and disaster research grew rapidly throughout the decade, and continued to gain popularity in this field as well as in the climate change and development literature in the decade that followed (Gaillard 2010, Cutter 1996).

Following the introduction of the concept of vulnerability in hazard and disaster research, the issue of defining vulnerability arose. Early definitions of vulnerability mostly referred to the quantitative degree of potential loss caused by a hazard (Gaillard 2007), which was in line with the quantitative focus of most of the hazard and disaster research in the 1970s and 1980s. Gradually definitions welcomed the integration of quantitative and qualitative data on potential loss, including data on the wider social context and the susceptibility of social groups to experience adverse consequences of a potentially damaging event (Cutter 1996, Gaillard 2007, Gaillard 2010). Hazard and disaster literature commonly refers to the likelihood of social groups to suffer such consequences as 'social vulnerability', referring to 'the propensity of a society to suffer from damage in the event of the occurrence of a given hazard' (Gaillard 2007: 522), and 'the conditions of people which make it possible for a hazard to become a disaster' (Cannon 1994: 13). Having learned from the deficits of the paradigm of the extreme, the social component of vulnerability could not be ignored; it was increasingly taken up by hazard and disaster research (Cannon 1994).

Despite the wide incorporation of a social component in the study of vulnerability, broad agreement on what the concept should encompass, failed to extend its reach beyond this point. Incongruity between classifications and typologies (Gaillard 2010), epistemological orientations, conceptual differences, the nature and regions of the hazards studied, the use of conceptual frameworks (Cutter 1996), and the variation of vulnerability over space and time (Wisner et al. 2004) resulted in a confused lexicon of approaches to the understanding of vulnerability. The growing list of definitions that developed (see Birkmann (2006) for examples) shows that just like vulnerability itself, ways of defining it are not static. The definition of vulnerability used in this research is that of the UNISDR (2004: 7): 'vulnerability encompasses the conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a society to the impact of hazards'. In addition to physical, social, economic and environmental factors, political and cultural factors are also considered to be of relevance.

A commonly accepted definition of vulnerability had not been agreed upon by the time hazard and disaster, climate change, and development research tentatively moved towards the notion that disaster-affected populations are not merely dependent and subordinate (Bankoff 2001), but are able to learn from and adapt to the experience of a disaster (Wisner et al. 2004). Up to that point definitions of vulnerability demonstrated an emphasis on the defencelessness, insecurity, and inability of societies to act in the face of hazards, and therefore had a rather negative connotation to it (e.g. Bogard 1988, Chambers 1989, Kates 1985, Timmerman 1981). The move away from this notion of viewing groups or societies as powerless to their environments is characterised by the rise of the concept of capacity in the late 1980s and early 1990s (Gaillard 2010, Wisner et al. 2004, Cutter 1996). Capacity commonly refers to the availability of, access to, and use of resources to anticipate, cope with, or recover from disaster (Davis et al. 2004, Kuban and MacKenzie-Carey 2001). It is strongly linked to the notion of agency, which is understood to mean people's capacity to play an independent causal role in history, thereby overcoming the viewpoint that people are powerless victims of disaster (Brown and Westaway 2011). In more

recent literature (e.g. Brown and Westaway 2011, Nelson et al. 2007) capacity and agency are at times discussed in a joint way by using the term 'adaptive capacity' which refers to all means enabling people to overcome disaster, including their power to mobilise physical and social resources: power ascribed to people's active attitudes in the face of disaster. In sum, the emergence of the concept of capacity was paired with a shift from viewing people as passive victims to seeing them as actors that are able to resist certain disastrous processes by using resources that are often endogenous to their society. The ways in which capacities are mobilised and resources used, reflect the coping mechanisms used to address adverse consequences of hazards (Gaillard 2010, Birkmann 2006). In line with Davis et al. (2004) it is here argued that capacities are not the opposite end of vulnerability on a single spectrum; societies can be very vulnerable, but still have a large array of capacities to deal with disaster.

3.2 The concept of resilience

As stated earlier, resilience is here defined as the capacity of a society to deal with and overcome the damage brought by the occurrence of natural hazards in order to obtain an acceptable and satisfactory standard of living, whether this implies a return to the pre-disaster social fabric or through accepting change. In addition to using the word 'capacity' to define resilience, this definition shows the resemblance of resilience to capacity and agency by emphasising the active role populations can take up in dealing with disaster, rather than placing emphasis on their weaknesses. Thus it comes as no surprise that the use of the concept capacity in hazard and disaster research was associated with an increased emphasis on resilience. Like vulnerability, resilience emerged in hazard and disaster literature in the 1970s (Gaillard 2010), but only gained popularity roughly two decades later, following the increased focus on capacity. The concept of resilience prompted a new way of conceptualising hazards and their consequences as it suggests a focus on building something up rather than just reducing something which is the case when talking about vulnerability reduction (Manyena 2006).

Just like the term 'social vulnerability' was used to emphasise the importance of taking the wider social context into account when addressing vulnerability, resilience as used in hazard and disaster, development, and climate change literature is at times referred to as 'social resilience' (e.g. Maguire and Hagan 2007, Adger 2000). Broadly speaking 'social' resilience (hereafter referred to as 'resilience') addresses what populations can do to respond to and recover from crises and disasters (Gaillard 2007, Manyena 2006). Through the HFA 2005-2015 (2005), the term gained increased recognition amongst practitioners and academics in the hazard and disaster field. It continues to heavily influence contemporary research in this field to date.

3.2.1 Defining resilience

Ironically, the concept of resilience has proven to be equally difficult to define as the concept of vulnerability. In trying to understand what resilience encompasses, what it excludes, and how it relates to vulnerability, several approaches to its interpretation emerged (Gaillard 2010, Gaillard 2007, Birkmann 2006, Manyena 2006, Klein et al. 2003). The first approach views resilience and vulnerability as positive and negative poles on a continuum (e.g. Twigg 2007, Folke et al. 2002, Secretariat of the Pacific Community- Applied Geoscience and Technology Division (SOPAC) 2002). In this viewpoint a group of people who are very vulnerable are not very resilient. A second approach, as described by Gaillard (2010, 2007) and Klein et al. (2003), views resilience as a component of vulnerability, or the ability of actors to cope with or adapt to shocks or stress caused by hazards. Pelling's (2003) breakdown of vulnerability into exposure, resistance, and resilience is a frequently quoted example of this. The Intergovernmental Panel on Climate Change's breakdown of vulnerability into adaptive capacity, exposure, and sensitivity could also be mentioned in this context, as the capacity to adapt is often seen as a part of resilience (Klein et al. 2003). A third approach refrains from defining resilience in relation to vulnerability. It looks at resilience as the capacity of a society to absorb and recover from the disastrous consequences of a hazard (Gaillard 2010, 2007, Timmerman 1981). The commonly used definition of the UNISDR (2002: 24) is in line with this approach:

> The capacity of a system, community or society to resist or to change in order that it may obtain an acceptable level in functioning and structure. This is determined by the degree to which the social system is capable of organising itself and the ability to increase its capacity for learning and adaptation, including the capacity to recover from a disaster.

Depending on the approach taken to defining resilience in relation to vulnerability the definitions of resilience vary. This is further complicated by the at times overlapping definitions of resilience and vulnerability. For example, Wisner et al. (2004: 85) use the term resilience as 'the measure of the rate of recovery from a stressful experience, reflecting the social capacity to absorb and recover from the occurrence of a hazardous event'. It bears a similarity to their definition of vulnerability (2004: 11): 'the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard'. Once more, similar to Wisner et al.'s (2004) definition of vulnerability is Timmerman's (1981: 21) definition of resilience as 'the capacity of a system to absorb and recover from the occurrence of a hazardous event'.

It becomes clear that the concepts of vulnerability and resilience are related properties, and that the relation between the two can be interpreted in various ways. In this research the two concepts are segregated by viewing resilience as mainly addressing the capacity of a society to deal with and overcome disaster (e.g. Gaillard 2007, Rose 2007), whereas vulnerability is mainly seen as a pre-disaster condition (Rose 2007, Cutter 1996), addressing the susceptibility, fragility, and exposure of a society to suffer disastrous consequences from hazards faced (Lewis and Kelman 2010, Cannon 1994). Vulnerability in this viewpoint relates to the risk of a hazard turning into a disaster, whereas resilience relates to how affected groups deal with disaster (Gaillard 2007). Addressing vulnerability and resilience in this manner invariably implies that the first approach to the interpretation of resilience, that of viewing resilience and vulnerability as positive

and negative poles on a continuum, is opposed in this research. This is further underscored by Gallopin's (2006) view of resilience, which states that a society may be resilient in the sense that it has been able to recover from an event, but this does not mean that it is necessarily less vulnerable to a hazard turning into a disaster in the future. Looking at resilience and vulnerability at the same moment in time, Gaillard (2010) and Davis et al. (2004) also argue that communities may be vulnerable, but still have a large capacity to cope with and recover from disaster. In addition, Klein et al.'s (2003) critique of the formation that keeps the first approach together seems legitimate; they place emphasis on the danger of circular reasoning: a society is vulnerable because it is not resilient, it is not resilient because it is vulnerable. As resilience is viewed as dealing with disaster, and vulnerability as the likelihood of a hazard turning into a disaster, the second approach to the interpretation of resilience is also largely disregarded. Although related, resilience is not seen as a component of vulnerability, and it is not necessary the case that opportunities for resilience are low when exposure is high, as argued by Pelling (2003).

The concept of resilience as used in this thesis draws mostly on the third approach, in which resilience refers to the capacity of a society to absorb and recover from disaster. Particular prominence is ascribed to the UNISDR's (2002: 24) emphasis on resilience as the capacity of a society to 'obtain an acceptable level in functioning and structure'. It differs from many definitions by not merely referring to the 'recovery' of a society. The use of the term 'recovery' without further explanation often gives the impression that resilience has to do with restoring the society's pre-disaster equilibrium. Replacing recovery by 'obtaining an acceptable level in functioning and structure' implies that an acceptable level of functioning can be achieved which may differ from its pre-disaster level. It relates to the various types of equilibria identified and discussed in systems theory. The notion of self-organisation cannot be overlooked in this context. Self-organisation refers to adapting to changing conditions as a system under pressure seeks a better fit between its functioning and the environment in which it operates (Bak and Chen 1991). In a social context, self-organisation refers to the specific actions people initiate under uncertain

conditions, such as a disaster scenario, to meet unexpected needs, ensure the survival of the group or society, and restore a sense of order (Comfort 1994, Kauffman 1993). These actions can be initiated and guided by groups formed prior to the disastrous event, but can also be the product of emergent groups: people who work together in pursuit of a common goal but whose organisation is based on new structures created in the face of disaster (Stallings and Quarantelli 1985). Whereas literature on self-organisation and emergent groups make the valid claim that a system's capacity for adaptation to changing conditions is critical to the survival and functioning of the social system, its focus is predominantly on responses during disaster, and considers recovery to a much smaller extent. The work of Gaillard (2007) is one of the few examples that examines disaster-related adaptation and changes in the functioning of groups in a context of recovery. He refers to resilient societies as those that are able to overcome the damage brought by the occurrence of natural hazards, either by maintaining or restoring their pre-disaster social fabric, or by creating an adapted 'normal' state of living which may be different but still be accepted by the affected population (Gaillard 2007: 523). As not many studies address change explicitly as a way of recovering from the havoc wrought by disaster (Gaillard 2007), this is a research need shaping the scope of this study. Change is further discussed in section 3.5. For now it is sufficient to state that Gaillard's (2007) emphasis on change, as well as the data gathered through fieldwork on Ghizo Island, assisted in shaping the definition of resilience as used in this research.

3.2.1.1 Community resilience

In addressing the resilience of a society in this thesis, the notion of 'society' refers to a group of people involved with each other on many levels. Discussing the resilience of a society can refer to the resilience of a nation as a whole or to smaller populations or groups of people within that nation. As detailed later in this chapter, there is a need for research on the variations in disastrous impacts at community level, particularly in SIDS.[12] To address this gap in research at this level of

[12] The following section will make clear how research on disaster impacts relates to resilience.

society, the research presented here focuses on community resilience: the capacity of a *community* to deal with and overcome the damage brought by the occurrence of natural hazards in order to obtain an acceptable and satisfactory standard of living. Resilience in this sense implies the self-reliance of communities in terms of the broader concept of sustainability (Rose 2004). Outside aid interventions are therefore not seen as part of resilience. In order to understand what community resilience implies it must first be clarified what is meant by 'community'.

The definition of community as used here is informed by the research participants' critique of researchers' frequent use of the term without ensuring that the researched 'community' agrees with the term (see Chapter 7), Brent's (2009: 261) claim that 'community is not a simple concept and is dangerous if is simplified', and Delanty's (2003) argument that community is a normative aspiration. It is considered of foremost importance to present a definition that suits the context of research as well as it aids a correct interpretation of the information presented in this thesis. Aided by McQueen et al.'s (2001) investigation on what a community is, the term community is here used to refer to a group of people who are linked by a sense of cohesion, which, as explained in Chapter 1, is based on similarities, ties, values, and shared experiences. Community resilience refers to the resilience of such a group of people. It does not refer to the resilience of individual people within that community, but to their resilience as a collective state (Brown and Kulig 1996/97, Ride and Bretherton 2011). As explained in Chapter 2, the research presented here focuses on four village-populations which saw themselves as four communities at the time the tsunami hit: two communities (inhabiting the villages of Pailongge and Saegeraghi) belonging to the Melanesian ethnic group and two communities (inhabiting the villages of Niu Manra and Nusa Baruka) belonging to the Gilbertese ethnic group. Hence community resilience in the context of this research mainly refers to the resilience of these four communities.

3.3 Resilience in a disaster management context

As explained in Chapter 1, the primary rationale for this research is to contribute to knowledge of resilience by looking at it in a disaster management or emergency management context. 'Disaster management' and 'emergency management' are two terms frequently referring to the same processes: the processes of managing the disastrous consequences of hazards. The terms are here interpreted as referring to all processes of crisis management after the occurrence of the 2007 Solomon Islands earthquake and tsunami: from the initial response of the communities to long-term recovery. In this thesis the term 'disaster management' is preferred over 'emergency management', as emergency management can give the impression that it is only the initial phase following the occurrence of the 2007 hazards that is addressed. Research on disaster management in this sense is at times referred to as 'post-disaster' research (e.g. Aldrich 2012, Mulligan and Nadarajah 2011, Birkmann et al. 2010). Although the latter refers to research on the aftermath of a hazard, there is a risk of interpreting it as research on the aftermath of disastrous consequences of a hazard.

Contemporary hazard and disaster literature predominantly addresses resilience in a pre-disaster context; both at academic and policy level resilience is primarily addressed in a sense of strengthening, building, or increasing populations' capacity to deal with and overcome disaster. When disaster strikes and a community is to 'demonstrate' its capacity to deal with and overcome disaster, the focus on resilience largely disappears; research on disaster management is often preoccupied with assessing damage and losses (Birkmann 2010). However, research on disaster management can provide valuable information on how resilient communities were to the disaster they experienced (Aldrich 2012, Bird et al. 2011); it can provide valuable information on how and why they were impacted the way they were. Based on Aldrich (2012), Bird et al. (2011) and Birkmann (2010) the main research question addressed in this thesis was identified and formed: In the aftermath of the 2007 Solomon Islands earthquake and tsunamis, how have disaster management processes informed community resilience? As this research was carried out as a

longitudinal, retrospective study (it involved repeated observations in the period of March 2011 to April 2013, including looking back in time), studying the disaster management processes on Ghizo Island not only provided information on the four communities' capacities to deal with and overcome disaster, but also on changes made during the disaster management processes with the aim of increasing their resilience (Birkmann 2010, Manyena 2006). Hence answering the main research question also generates knowledge on indicators of the communities' resilience to future disaster.

How the communities dealt with disaster is addressed by studying their response; how they overcame disaster by looking at their recovery. Response and recovery are here considered as the two phases encompassing all processes of disaster management. How response and recovery are understood, is discussed below. Before doing so, it is worth explaining that this way of looking at the disaster management processes informed the three sub-questions posed to answer the main research question. Each of these questions is largely addressed by one of the empirical chapters (see Table 3). The first sub-question (A), 'How did ethnically different communities respond to the same event?', addresses how communities dealt with disaster. Hence, this is researched by studying their response. This sub-question is mainly addressed by Chapter 5. The second sub-question (B), 'How did aid interventions influence communities' disaster management processes?', relates to both the response and recovery of the affected communities; aid interventions were present in both phases. Chapter 6 focuses on this question, and will explain this further. The third sub-question (C), 'How did communities' responses and aid interventions influence long-term recovery?', addresses how communities overcame disaster. Hence, this is linked to recovery. Communities' responses and the aid interventions were two major influences on how the affected communities recovered, and hence shaped ways of overcoming disaster. This sub-question is mainly addressed by Chapter 7. Table 3 below presents a visual overview of the focus on the empirical chapters, along with which sub-questions they mainly address. This table is

used and expanded throughout this thesis to aid the understanding of what is being addressed at what particular point in the coming chapters.

Table 3 Phases of disaster management

Sub-question A	*Ch. 5*	RESPONSE (Phase 1)	*How communities dealt with disaster*
Sub-question B	*Ch. 6*	RECOVERY (Phase 2)	*How communities overcame disaster*
Sub-question C	*Ch. 7*		

Without providing further explanation, 'dividing up' disaster management processes into the phases of response and recovery would be open to (legitimate) criticism; despite response and recovery being recurrent notions in definitions of resilience (e.g. Aldrich 2012, Bird et al. 2011, Gaillard 2007, Maguire and Hagan 2007, Gaillard 2006, National Research Council (NRC) 2006, O'Brien et al. 2006, Smit and Wandel 2006, Rose 2004, Paton et al. 2000) and in descriptions of disaster management phases, they cannot be used without additional explanation. The two terms are frequently grouped together (e.g. Kelman and Mather 2008, Paton and Johnston 2001), used inconsistently, or used without specifying what each concept implies. To further complicate their understanding, concepts as relief, rehabilitation, reconstruction, and regeneration are also used interchangeably in disaster management literature, at times referring to (parts of) response or recovery. Many hazard and disaster researchers have used cyclical frameworks in which a variety of such concepts are presented as consecutive phases of a disaster event (e.g. Thieken et al. 2007, Kienholz et al. 2004). As these cyclical models imply a return to the disaster and allow no room for changes in the resilience of disaster-affected communities, such models are not used in this thesis. Nevertheless, analysing such models, and phases identified therein, contributes to an enhanced understanding of the definitions and uses of these various concepts. In accordance with Kenny et al. (2010) this understanding was combined with voices from the context researched to structure thinking about disaster management processes. Chapter 6 details more on the distinction between the phases research participants from Ghizo made whilst discussing post-

tsunami timelines (see sub-section 4.4.2.5, Chapter 4 for a description of this method). How these concepts are used in this thesis is explained in more detail in the following two sub-sections.

3.3.1 Response

The response to hazards has been addressed by many contemporary studies in the field of hazard and disaster research. These studies vary from the response to disasters caused by technological hazards, such as nuclear explosions, to the response to natural hazards such as earthquakes, tsunamis, landslides or cyclones. Considering the rapid-onset nature of the hazards addressed in the research presented here, particular attention was paid to works focussing on the response to rapid-onset natural hazards. Examples are Muñiz' (2006), Sobel and Leeson's (2006) and Perilla et al.'s (2002) studies on responses to hurricanes, Tatham et al.'s (2009) and Campbell's (1990) works on cyclones, and Smith's (2013) study on the 2010 Haiti earthquake. Responses to tsunamis are largely studied with regard to the Indian Ocean tsunami of December 2004 (e.g. Gaillard et al. 2008, Cosgrave 2007, Telford and Cosgrave 2007, De Ville de Goyet and Morinière 2006, Telford et al. 2006). Several works on responses to the tsunami that hit Japan in March 2011 are available at the time of writing (e.g. Kingston 2012, McCurry 2011), and more will likely be published in the coming few years. McAdoo et al. (2009) and Fritz and Kalligeris (2008) detailed the responses to the 2007 Solomon Islands tsunami. These examples of literature cover a variety of interpretations of response such as organisational, governmental, private, international, national, local, medical, and community response. As the focus of this thesis is on community resilience in a disaster management context, 'response' is used in this thesis to refer to community response.

Local communities are on the frontlines of both the immediate disastrous impact and the initial, disaster response, which is crucial for saving most lives (UNISDR 2007: iii). Knowing how to respond is of particular importance for communities living in non-industrial, isolated places as the timely provision of disaster aid to such areas often faces great challenges (Gaillard et al. 2009, Paton et al. 2006, Mercer 2004). Like literature on other kinds of response, literature on

community response defines response in a variety of ways. Nevertheless, its descriptions frequently refer to mechanisms or strategies of coping with emergency (e.g. Gaillard 2007, Thieken et al. 2007, Paton et al. 2000). Building on these associations, coping and coping mechanisms (strategies of survival to deal with the immediate disastrous impacts of a hazard or hazards) are here seen as part of response. An affected community's capacity to cope with disaster depends on resources available and the community's ability to draw upon these resources when a disastrous hazard affects them (Gaillard et al. 2008, Paton et al. 2006). The strength of a community's coping capacity is of particular importance during rapid-onset hazards as these hazards allow little time to acquire external resources during the period of impact (Paton et al. 2006). A community's coping mechanisms therefore reflect their capacity for self-reliance (Paton et al. 2006), and are tied to the social, cultural, political, and economic constraints and opportunities present in the every-day life of people (Gaillard et al. 2008, Wisner et al. 2004); they are not a separate rescue system (Holland and VanArsdale 1986).

However, coping is not viewed as the equivalent of response, but as a stage thereof. In this study, research participants placed emphasis on their ways of coping in the first days after the earthquake and tsunami, but separated these actions and behaviours from those to do with their initial reactions upon realising that something was going on. Building on this, response is here defined as the communities' ways of limiting and dealing with the immediate disastrous impacts of a hazard. It is the first phase of disaster management and encompasses two stages: the immediate, initial reaction to the first signs of the hazards, and the subsequent coping mechanisms (see Table 4). As a community's resilience is influenced by their capacity to deal with damage brought by the occurrence of natural hazards, knowing how to respond shapes their resilience. Before moving on to the next sub-section, it must be stated that disaster aid interventions frequently influences communities' responses: how a community responds to disaster changes when humanitarian interventions bring in aid that eases their struggle for survival (see Chapter 6).

Table 4 The first phase of disaster management: response

Sub-question A	*Ch. 5*	RESPONSE (Phase 1)	*How communities dealt with disaster*	Stage 1: initial reactions Stage 2: Coping mechanisms
Sub-question B	*Ch. 6*	RECOVERY (Phase 2)	*How communities overcame disaster*	
Sub-question C	*Ch. 7*			

3.3.2 Recovery

'Community resilience does not merely refer to the efficiency of community response but also to their capacity far beyond this', argues Manyena (2006: 438). It is a legitimate call for more research on community recovery, as disaster management research tends to focus much more on response alone (Brusset et al. 2009, Hystad and Keller 2008, NRC 2006, Berke et al. 1993). Of the studies that do address recovery, only a small portion focuses on community recovery. In addition, not many studies explicitly state what is understood by the term (Nakagawa and Shaw 2004), and many address community recovery by separating out various aspects, such as physical, natural, social, and economic community recovery (e.g. Australian Emergency Management Institute (AEMI) 2011). However, in order to make informed statements on community resilience, all aspects of community recovery should be equally considered. Community recovery is therefore not split up in different segments, but is here researched in a holistic way. From this point onwards, the term 'recovery' refers to community recovery.

As indicated earlier in this chapter, recovery as a concept is frequently used in an ambiguous manner: when used without further explanation it can give the impression that it emphasizes a reactive stance which focuses on restoring or bringing back the previous normal condition (Manyena 2006) or routine performance (Paton et al. 2000), whilst not allowing for obtaining a new acceptable level of functioning. In addition, explanations of what recovery refers to are inconsistent throughout hazard and disaster literature; some see recovery as one of many phases of disaster management (e.g. Kienholz et al. 2004), whereas others see it as a phase overarching other phases (e.g. Thieken et al. 2007). Despite the critique on the term recovery, it is used in this

thesis to refer to the phase of disaster management following response (see Table 4), as this is how research participants used the term. However, in order to use this term, it must be understood what is implied by recovery. Recovery here refers to all processes contributing to overcoming disaster and recreating a normal state of living, one that is accepted by a disaster-affected community. This can, but does not necessarily, imply a return to the community's previous conditions of functioning; it can also imply the creation of a new level of functioning. Within the context of this research, recovery refers to the period up to six year after the events, as this is the time period addressed in this research. Whilst acknowledging that interpretations of short-term and long-term recovery vary, this is here referred to as long-term recovery.

Recovery is seen as differing from response by moving away from a focus on survival and stabilising emergency to a focus on rebuilding lives and livelihoods. Research participants viewed recovery as a process instigated by provisional solutions (such as emergency shelter) and with a focus on lasting solutions (such as more permanent housing). The aid interventions as described in Chapter 6 are very much in line with this: the humanitarian aid bringing mainly provisional solutions, and the aid that followed more lasting ones. Some literature refers to this as rehabilitation and recovery (e.g. Keinholz et al. 2004), others to medium-term and long-term response or recovery (e.g. Delaney and Schrader 2000). Research participants did not explicitly divide recovery into stages, nor did they use descriptions of possible stages that could be covered by the use of such terms. Based on this, recovery is used in this sense. This choice is strengthened by Telford et al.'s (2006) reasoning that recovery is context-specific, and Mulligan and Nadarajah's (2011) argument that no arbitrary frames can be placed on phases within disaster management. Although such frameworks may appear to facilitate the understanding of disaster management processes, if based on external frameworks derived from hazard and disaster literature, and without taking the local context into account, they may in reality contribute to misunderstandings and incorrect interpretations. Nevertheless, without putting labels on possible stages of recovery, it can be stated that by studying a period of six years the current research addresses the need for

research on long-term hazard impacts as phrased by Méheux et al. (2007) and recovery (Brusset et al. 2009, Hystad and Keller 2008, NRC 2006).

Chapter 7 mainly addresses recovery. As a community's resilience is influenced by a community's capacity to overcome damage caused by the occurrence of natural hazards, their capacity of recovery contributes to their resilience. How they recover, and what changes in their pre-disaster way of living are made, generates knowledge on indicators of the communities' resilience to future disaster. The following section details on such indicators and characteristics.

3.4 Characteristics of resilient societies

Building societies' resilience to disasters and substantially reducing disaster losses by 2015 is the overarching goal of the HFA. The emphasis on resilience will likely continue post-2015 as the HFA's successor arrangement is to build on the HFA and to continue prioritising resilience. This focus on resilience is largely centred on promoting, strengthening, building, or increasing resilience of societies at risk of disaster. This cannot be done without operationalizing resilience. A thorough analysis of literature provides several key characteristics and indicators of resilient societies. Yet, as definitions of resilience vary, characteristics of resilient societies vary as well. Based on the definition of resilience previously given, Table 5 provides an overview of characteristics of resilient societies. Where possible these characteristics are tailored to the context of rural communities in developing countries. Some characteristics are more applicable to societies on a macro-level (e.g. effective governance), although they can still be of relevance. Each of the characteristics is provided with a brief explanation and examples of possible indicators. As the characteristics are those of social systems and social systems are holistic systems of which the components are interlinked with one another, the characteristics below show some extent of overlap.

Table 5 Characteristics of resilient societies
Based on Mercer et al. (2012), Fazey et al. (2011), Bahadur et al. (2010), Birkmann (2010), Gaillard (2007) and Twigg (2007).

	Characteristics	Explanation	Examples of possible indicators
1.	High diversity (Fazey et al. 2011: 2, Bahadur et al. 2010: 14)	-Strength of diversification of income-producing livelihood activities; -Strength of diversification of direct food-producing livelihood activities; -Diversity of options to respond and recover from disaster.	-Not relying on livelihoods in one geographical location, or not relying on one type of food within a livelihood activity.
2.	Social values and structures (Bahadur et al. 2010: 17)	-Social capital, including trust, norms, care, and networks and associations; -Shared ethical standards and community values, and attitudes and motivation; -Cooperation and coordination in community (which can lead to more equitable access to resources).	-Community managed funds, shared (cultural) values, notions, attitudes, and ideas (e.g. towards social interaction).
3.	High degree of equity (Bahadur et al. 2010: 16, Twigg 2007: 17, 25, 30)	-Equal distribution of and access to wealth, assets and resources; -Gauging, sharing and distributing risk from disturbances; -Presence of equity and justice; -Community cohesion -Strong equitable community.	-Equity in: hazard and disaster-related knowledge, education, land rights, intra-community social protection.
4.	Openness to/acceptance of change (Bahadur et al. 2010: 15, 17, Birkmann 2010, Gaillard 2007)	-Working with change instead of fighting it.	-Changing practices based on lessons learned from past disasters; - Not finding it necessary that the society returns to its previous equilibrium, if this was a state in which it was vulnerable.
5.	Learning (Twigg 2007: 17)	-Learning from experience; -Learning to deal with uncertainty.	-Learning from past disasters can aid dealing with future disaster.

Table continues on next page

6.	Preparedness, planning and readiness (Bahadur et al. 2010: 16, Twigg 2007: 8, 30, 33-35)	-Inclusion of society's failure scenario in response plans; -Preparedness plans developed through participatory methods and supported by community members; -Roles and responsibilities agreed and understood; -Emergency infrastructure; -Emergency resources.	-Have strategies to cope in case emergency aid stays out; -Training, simulation and review exercises; -Evacuation route, emergency supplies in place; -Emergency shelter, community funds.
7.	Inclusion of local knowledge (Mercer et al. 2012, Bahadur et al. 2010: 16, Twigg 2007: 18)	-Involvement of community in emergency response/aid; -Co-management or greater ownership of resources; -Decentralisation; -Bringing different kinds of knowledge together; -Listen to community-based observations.	-Locally relevant disaster subcultures based on experiences; -Combining traditional and scientific knowledge to enhance the capacity to learn from and deal with disastrous events.
8.	Effective institutions (Bahadur et al. 2010: 14)	-Credible, legitimate, effective institutions and institutional structures based on trust, norms, and networks. Attention should be paid to the extent to which these organisations are decentralised, inclusive, and unbiased.	-Civil society institutions, community-based organisations, social organisation within the community, but also religious groups and cultural or ethnic groups.
9.	Effective governance (Bahadur et al. 2010: 15, Twigg 2007: 1)	-Decentralised organisational structures and policies that are flexible and in touch with communities' needs and local realities, and that represent the communities; - Community members' awareness of and access to their rights; -Integration of disaster reduction measures in sustainable development planning; -Means by which societies shape power and individual and collective action.	-Equitable and inclusive implementation of policy aimed at increasing community resilience at village-level.

Table continues on next page

10.	Cross-scalar perspective (Bahadur et al. 2010: 17, 18)	-Strong political, cultural, economic, social and natural links of one society with another society/community at regional or global level	-Relations across kinship networks or ethnic groups.

Research into a society's characteristics through identifying indicators such as those listed above can provide an impression of its resilience. Nevertheless, characteristics of a resilient society may change in the face of disaster. A society can, for example, fall apart when access to resources means the difference between life and death. Hence, assessing a society's characteristics of resilience at a pre-disaster stage can only provide estimations of the researched society's resilience to future disaster. These estimations are subject to change and are not fixed predictions.

3.5 Fine-tuning the scope of research: addressing gaps in literature

Chapter 1 explained that the foremost research need informing this study was the need to analyse communities' responses and processes of recovery in order to generate a better understanding of their resilience to the disaster experienced and to provide knowledge on (changes in) these communities' characteristics that relate to those of resilient societies. The following sub-sections narrow down the exact scope of the research. By analysing hazard and disaster literature it is illustrated how certain directions and preoccupations in this field implied the neglect of further possible directions of research. Identified as areas that need investigation, the topics described in the three sub-sections below were used to fine-tune the focus of the research presented here.

3.5.1 Type of country and level of society

The first factor shaping the exact focus of this research is the type of country studied and the level of society on which the disaster research is carried out. Within hazard and disaster research focusing on societies' capacity to deal with and overcome disaster, the majority of work has been

on developed rather than developing countries (Gaillard 2007). In particular, hurricane Andrew (e.g. Zhang and Peacock 2009, Perilla et al. 2002, Girard and Peacock 1997) and hurricane Katrina (e.g. Cutter et al. 2006, Elliot and Pais 2006, Logan 2006, Muñiz 2006, Sobel and Leeson 2006) that hit the U.S.A. in 1992 and 2005 respectively are studied extensively. Fewer studies focus on the capacities of developing countries, or groups therein, to deal with disaster (Gaillard 2007). This scarce literature largely addresses the disaster management processes following the 2004 Indian Ocean tsunami (e.g. Mulligan and Nadarajah 2011, Clarke et al. 2010, Shaw 2010, Keraminiyage et al. 2008, Mulligan and Shaw 2007, Domroes 2006). According to Mulligan and Nadarajah (2011) these studies are in general narrow evaluations of disaster management processes that do not do justice to the complexity of the situation, therefore allowing little opportunity for learning. Based on research on the same disaster, Keraminiyage et al. (2008) claim there is a need for research on disaster management processes in developing countries as these processes differ from those in developed countries. They argue that the lack of in-depth data on the former restricts the development of further knowledge of these differences. As the Solomon Islands are classified as a Least Developed Country (LDC) by the United Nations, research on resilience in a disaster management context in this country contributes to closing the gap in data and providing more opportunities for analysing differences.

In addition to its LDC status, the Solomon Islands are also one of the SIDS, as well as being a Pacific Island Country (PIC). Resulting from their unique geography, SIDS, and PICs in particular, share similar attributes undermining their possibilities for sustainable development (Gero et al. 2010, Kelman 2010, Kelman and West 2009, Méheux et al. 2007, UNISDR 2005, Pelling and Uito 2001). Examples are their exposure to geological and/or climate-related natural hazards. Additionally, SIDs and PICs share particular vulnerabilities, such as small land areas and populations living on the coast, which result in hazard-impacts unique to their context. Despite the acknowledged high level of exposure to natural hazards and SIDS' specific vulnerabilities, Kelman and West (2009) and Méheux et al. (2007) argue there is a shortage of SIDS studies

focusing on social and environmental impacts of natural hazards on community-level. Méheux et al. (2007) therefore emphasize the need for SIDS-specific research on the impacts of natural hazards and cultural coping mechanisms, and Kelman et al. (2011) call for island-based disaster research. Again, as the Solomon Islands are one of the SIDS, research on disaster management processes at community level contributes to addressing these research needs.

3.5.2 Ethnicity

A second factor shaping the specific focus of research is ethnicity. 'Affected people and communities are not homogenous entities' argue Telford and Cosgrave (2007: 18) in their study on the 2004 Indian Ocean tsunami, calling attention to ethnicity in disaster management processes. It may seem an obvious statement, yet ethnicity was long neglected in hazard and disaster research. During the paradigm of the extreme (as discussed in section 3.1), societies' behaviour in the face of hazards was largely seen as dependent on the type of hazard, not on the characteristics of those facing it. As the influence of social sciences in hazard and disaster research grew in the 1970s and 1980s, factors characteristic of the population, and the context they live in, increasingly received attention in studies of disaster management (Quarantelli 1991, Wenger 1978, O'Keefe et al. 1976) but also in a wider context. A prominent example of the latter is the environmental justice movement, in which ethnicity in relation to disproportionate environmental risk was brought to the foreground.

Nevertheless, according to Gaillard et al. (2008) variations amongst populations' responses and recovery within ethnically diverse environments are still overlooked, particularly in developing countries. In line with the gap in research identified in sub-section 3.5.1, the role of ethnicity in disaster resilience is mainly studied in developed countries (Paton et al. 2008), and within these countries the vast majority of studies are on the U.S.A. (Gaillard et al. 2008). The works of Fothergill et al. (1999), Bolin and Bolton (1986), and Perry and Mushkatel (1986) present rich overviews of studies on ethnicity and disasters in the U.S.A., providing frameworks for research

on this topic in a north-American or developed countries' context. Until recently research on disaster resilience and disaster management processes in developing countries barely touched on ethnicity, and if it did it was by linking it to poverty (Girard and Peacock 1997, Wisner et al. 1994). Contemporary studies that do address ethnicity in a developing country context predominantly deal with the Indian Ocean tsunami (e.g. Amarasiri de Silva 2009, Brun and Lund 2008, Gaillard et al. 2008, Keraminiyage et al. 2008, Paton et al. 2008, Paz 2005). Examples of studies on other disasters in this context are those of Seitz (1998), Gaillard and le Masson (2007), and Holland and VanArsdale (1986).

Despite few studies undertaken, those on developing countries unanimously indicate that ethnicity influences variations in response, for example in the initial reaction to the hazard (Gaillard et al. 2008), the likelihood of evacuation (Gladwin and Peacock 1997), access to help or support networks (Bolin and Bolton 1986), and reliance on external aid (Perry 2007, Telford and Cosgrave 2007). Also in recovery processes ethnicity is of influence (e.g. Bolin and Bolton 1986, Gaillard 2002, Gaillard et al. 2008, Girard and Peacock 1997), particularly with regard to relocation and resettlement. In ethnically mixed populations, the distribution of power in a pre-disaster context can have grave implications for response and recovery, argues Amarasiri de Silva (2009). 'Power' in an inter- and intra-community context, briefly touched upon in the previous chapter, comes back at several points throughout this thesis, particularly in Chapter 6. Based on Foucault (1980, 1982) power is here understood as a complex strategic situation of relations between individuals or groups in a given social setting, enabling possibilities for action for some whilst constraining these for others. Foucault (1982) argues that power relations are present in everyday life, and frequently concern struggles against the power effects of the opposition of certain individuals or groups over others. He states there are three types of struggles: against forms of domination (ethnic, social, and religious), against forms of exploitation, and against that which ties the individual to himself [sic] and submits him to others in this way (Foucault 1982: 781).

Studies on ethnicity and disaster management processes show the importance of conducting research in an ethnically varied environment, particularly in developing countries as these commonly display great ethnic diversity (Gaillard et al. 2008). By looking at the role of ethnicity in disaster management processes at a community level, this research not only addresses Gaillard et al.'s (2008) point, but also Méheux et al.'s (2007) call for research on variations in impacts between communities in SIDS along with investigating local coping mechanisms and longer-term adaptation to these impacts.

Two studies on ethnicity are of particular relevance to the research presented here are briefly discussed below. Concepts and ideas presented in these studies are heavily referred to and discussed in the empirical chapters (Chapter 5 in particular). The first study is Gaillard et al.'s (2008) work on ethnic groups' responses to the Indian Ocean tsunami. It is a valuable example of a community-based case study on the role of ethnicity in dealing with disaster in a developing country. The authors discuss the importance of cultural, social, economic, and political contextual differences as factors influencing ethnically diverse groups' disaster management processes. Particular attention is given to Anderson's (1965: 3) concept of disaster subculture as 'those subcultural patterns operative in a given area which are geared towards the solution of problems arising from the awareness of some form of almost periodic disaster threat'. It can be argued that this concept also relates to the notion of self-organisation, as briefly addressed at an earlier point in this chapter, in the sense that behavioural patterns aimed at survival become inherent to a group's functioning and can be seen as a type of emergent self-organised response (Vigoda 2002). Gaillard et al. (2008) draw attention to this concept's focus on life-saving knowledge built through experiencing past disasters. Though it was not the only factor influencing differences in affected groups' capacities of resilience, Gaillard et al. (2008) argue that the presence or absence of a disaster subculture played a large role in creating differences in ethnic groups' responses to the tsunami. Disaster subcultures are discussed in more detail in Chapter 5. The second study is that of McAdoo et al.'s (2009) research on ethnic groups' reactions to the 2007 Solomon Islands

tsunami, the same event addressed by the research presented here. Their study addresses five islands affected by the earthquake and tsunami, amongst which Ghizo Island. They claim that Melanesian Solomon Islanders knew how to react to the tsunami as a result of indigenous knowledge. McAdoo et al. (2009) argue that the Gilbertese minority group lacked such indigenous knowledge and hence died in disproportionate numbers. Influenced by these two studies, the choice was made to address resilience in a disaster management context and in an ethnically diverse setting: Ghizo. In addition to McAdoo et al.'s (2009) and Gaillard et al.'s (2008) studies' dominant focus on the response phase, this thesis addresses ethnicity in both the response and recovery phase.

3.5.3 Resilience and change: changing resilience

A third factor shaping the focus of this research is the fact that the notion of change is welcomed when addressing resilience. As illustrated in the above sections, the use of the term resilience in this context accepts the notion of change in creating a satisfactory state of living that is approved of by the disaster-affected population. The definition of change as used in this research is derived from Birkmann et al. (2010)'s study on hazards and disasters as opportunities for change. It is defined as an alteration in an affected population's state or direction of social, economic, political, and environmental conditions that deviates from pre-disaster conditions, and which is substantial in terms of the impact on people's lives (Birkmann et al. 2010: 638). In the context of this research particular attention is paid to the social conditions. Especially when studying how disaster-affected populations recover, it is important to keep the notion of change in mind; the recovery phase allows a greater scope for redefining or recreating a 'normal' state of living than the response phase does, as the move away from a focus on survival means less pressure on taking quick and fast actions.

However, as discussed previously, the concept of resilience often implies a return to a steady state (e.g. Gallopin 2006), particularly when making reference to the term recovery without

further explaining this term. Establishing a level of functioning different from the pre-disaster fabric of the society is often not acknowledged when addressing resilience; there is a lack of studies welcoming the notion of change (Birkmann et al. 2010), particularly in the context of developing countries (Gaillard 2007). However, the more recent the body of work on (self-) transformation (e.g. Pelling 2011) should be acknowledged in this context. This literature addresses change in the sense of transformation: deep forms of adaptation or radical change as alternatives to the pre-disaster state of living. Whereas literature on transformative learning is of value to this thesis with regard to its focus on 'learning communally and through practice and experience' (Pelling et al. 2014), its common focus on fundamental reforms of socio-political regimes and over-turning established rights systems requiring deep shifts in the ways society organises itself, plays less of a prominent role considering this research's focus on the community-level. Nevertheless, examining changes on community level can only be carried out thoroughly when being open to the idea of transformation self-initiated by communities. However, in this thesis the notion of transformation is interpreted as referring to fundamental and deep reforms whereas 'change' is seen as an alteration, not a fundamental reform, within communities. Considering the data gathered throughout fieldwork, the focus in this thesis is more on community-initiated change than on (community-initiated) transformation. Taking a closer look at the small corpus of studies addressing resilience in developing countries, Gaillard (2007) identifies three theoretical frameworks in which these studies can be grouped, and only one of these makes mention of change.

The first framework views populations in developing countries as unable to deal with rapid-onset hazards because they largely depend on their natural environment. When destroyed, this environment can no longer be relied upon for the provision of resources. Therefore aid in the form of technology, knowledge and experience should be transferred to disaster-affected developing countries. The second theoretical framework takes an opposite stance; it views developing countries as able to recover on their own. Proponents of this approach state that

disaster aid interventions disrupt the processes of response and recovery (e.g. Cijffers 1987, Torry 1978). An inability of developing countries to deal with the adverse consequences of hazards is seen as a result of disaster aid interventions, not of a possible incapability of the affected populations. A third framework deviates from the preoccupation with external aid by arguing that the occurrence of a disaster acts as a catalyst of on-going cultural change in the light of globalisation (e.g. Oliver-Smith 1996, Torry et al. 1979). Although this framework addresses change more in relation to globalisation than relating to disaster, it is the only framework that refers to change. One of the few studies that relates globalisation and change to disaster resilience, and addresses this by focusing on rural communities in a SIDS-context, is that of Mercer et al. (2007). Pairing globalisation with modernisation, this study stresses the loss of communities' cultural coping mechanisms, and the negative impacts on the communities' capacities to respond to and recover from disaster. Hence, an analysis of Mercer's (2007) study through the third and only framework that touches on change when addressing resilience in developing countries suggests that a disaster accelerates on-going change impacting on community resilience in negative ways. This idea is further analysed in Chapter 7.

Yet, despite welcoming the notion of change, the third framework has its shortcomings. Like the other two frameworks, it does not take account of the agency of the affected populations: change is not dealt with as something that can be initiated in an active and conscious manner. Additionally, when addressing change in this way in a context of disaster management, Mercer et al. (2007) mainly point to changes impacting on resilience in a negative manner. Based on these perceived limitations, Gaillard (2007) analysed nine case studies of developing countries' populations' processes of disaster management. His findings indicate that in most cases affected populations adopt changes in their pre-disaster way of life to respond to and recover from the disastrous impacts of a hazard. It emphasises that change can also be actively initiated and positive. Hence, it is here argued that if resilient societies are those that are able to deal with and overcome disaster, then societies that turn to change as a way of tackling disaster, are resilient.

By investigating resilience and change, whether negative, positive, actively initiated or not, this thesis addresses the gap in research on resilience and change in developing countries.

Changes strengthening or undermining affected populations' resilience to the disaster faced can also influence their resilience to deal with future disaster. Whether this is the case or not depends on the extent and duration of change, which are shaped by contextual conditions that vary in time and space (Griswold 2012, Birkmann et al. 2010, Gaillard 2007, Gupta and Ferguson 1992), and by the disastrous event itself. Hazard and disaster literature points to three important factors influencing the extent and duration of change: 1) the desirability of change, 2) the extent of damage caused by the hazard, and 3) the frequency with which the event that caused disaster takes place. The first factor implies that change made out of choice is likely to last longer than change made out of necessity. The second factor indicates that if populations are adversely impacted on a large scale they are more likely to make and sustain changes in their processes of overcoming disaster than when the impacts are small (Birkmann et al. 2010, Gaillard 2007). The third factor implies that if the disaster in question is caused by a high-frequency hazard, the extent and duration of change to deal with the effects of such hazards are likely to be larger than if the hazard would be a relatively exceptional event. Hence, change may be sustained or not depending on how it is influenced by these factors. Chapter 7 in particular explores this.

3.6 Conclusion

This chapter provided the theoretical framework of this thesis by exploring theories used in the understanding of resilience, particularly when addressing resilience in a disaster management context. By evaluating gaps in literature and needs for research, it also explained how the exact scope of the research presented here was shaped. Furthermore, this chapter provided a conceptual framework by embedding concepts of importance, used throughout this thesis, in their theoretical context, albeit touching base with the empirical context where necessary.

The chapter explored how debates in hazard and disaster literature since the 1970s increasingly acknowledged a human component in the creation and unfolding of disaster. A growing focus on vulnerability, followed by an emphasis on capacity, eventually gave rise to a focus on resilience. Resilience, and its focus on the agency, rather than the inferiority of populations facing disaster, continues to influence hazard and disaster debates, despite the absence of consensus on what the concept exactly implies. It is important to consider how 'change' can fit into the understanding of resilience. Change, ethnicity in disaster management, and a focus on community level in SIDS, informed the scope of this research on resilience.

Resilience is often addressed in a pre-disaster context, whilst research carried out after the disastrous hazard took place is often pre-occupied with assessing damage and losses. This chapter drew on the argument that affected communities' capacities to deal with and overcome disaster are worth researching as important knowledge and insights can be derived from this. It was explained that this study addresses such processes, referred to as processes of disaster management, which are divided into two phases: response and recovery. To aid researching resilience in a disaster management context, several characteristics of disaster-resilient societies were listed, tailored to the context of communities in developing countries and/or SIDS. This overview provided a framework for researching community resilience in a disaster management context in the Solomon Islands. Characteristics of resilient societies presented in this overview serve as a point of reference in researching resilience to the 2007 earthquake and tsunami, and it was argued that changes in these characteristics can be indicative of changes in resilience to future disaster.

The next chapter considers the methodology and methods used for fieldwork on Ghizo Island in the Solomon Islands. It demonstrates which methodological influences were drawn upon to shape the data collection in the field. Additionally, it illustrates why certain methods were chosen and

how the use of these methods contributed to answering the research questions presented in this chapter.

Chapter 4

Methodology and methods

This chapter outlines the methodological approach adopted during fieldwork on Ghizo Island, the Solomon Islands in 2011, 2012 and 2013. It also explains how and why specific methods were used, and how they contributed to answering the main research question and the three sub-questions that guided this research:

In the aftermath of the 2007 Solomon Islands earthquake and tsunamis, how have disaster management processes informed community resilience?

A. How did ethnically different communities respond to the same event?
B. How did aid interventions influence communities' disaster management processes?
C. How did communities' responses and aid interventions influence long-term recovery?

As discussed in Chapter 3, from the 1970s onwards hazard and disaster research started to focus more on the social side of disaster: the role of human behaviour in hazards turning into disasters. This gradually resulted in questions concerning the ethical dimension of studying disaster and disaster survivors. Anthropologist Anthony Oliver-Smith (1996: 319) defined this as the need for 'more dialogic, open-ended methods' in disaster research, as these methods are 'more appropriate and methodologically more effective'. His work draws attention to the increasing sharing of research methods between different disciplines studying disasters in the 1990s. This trend continued in the years that followed. Since the early 2000s, several of these studies, carried out by social and physical scientists alike, have been characterised by an extensive use of qualitative methods informed by ethnography, and with a focus on harmony, teamwork, and

knowledge exchange (e.g. Cronin 2004, Cronin et al. 2004, Donovan 2010a, Mercer et al. 2008, Petterson et al. 2008).

How disaster management processes inform community resilience can only be investigated adequately by paying careful attention to the context of influence on the resilience researched. Particularly when carrying out research in a cultural context different from that of the researcher, there is a need for a methodological approach adapted to the field and which respects its ethical codes of conduct. The flexibility associated with interdisciplinary research allowed my approach of research and choice of methods to be informed by the context of research, not by the boundaries of a single discipline. From the perspective of higher education institutions this has at times been perceived as a limitation of interdisciplinary research. Concerns have been raised with regard to which department would benefit from such research, and which disciplines' demands the research would satisfy (McNeill 1999). However, real-world research problems rarely arise within orderly disciplinary categories (Palmer 2001), and the real world is what shaped my methodology.

Two approaches were of particular relevance to how I carried out research in the Solomon Islands: ethnography, and indigenous and decolonising methodologies. Section 4.1 discusses what ethnography is and presents a critical reflection of this approach; section 4.2 does the same but with regard to the critical and indigenous methodologies. How these two approaches shaped my methodological approach is discussed in section 4.3. Section 4.4 addresses the specific methods used during fieldwork. In section 4.5 I address translation and language barriers, and section 4.6 provides details the importance of reflexivity in my field research. The concluding remarks of this chapter are presented in section 4.7.

4.1 Ethnography

Ethnographic research is often described as a largely qualitative approach, aimed at presenting encounters, events, and activities of the research participants and their context without great

distortion (Goodson and Vassar 2011), and in a way that is meaningful to readers, and 'empirical enough to be credible and analytical enough to be interesting' (Van Maanen 1988: 29). According to Hammersley and Atkinson (2007: 3), ethnographic work usually has most of the following features: 1) the focus is on a few small-scale cases, 2) data collection is relatively unstructured, 3) people's actions are studied in everyday contexts, 4) data are gathered from a range of sources, and 5) the analysis of data involves the interpretation of meaning and consequences of human actions. In accordance with the third feature, it is an approach in which participant observation plays a prominent role; to be able to recognise and develop behaviours the researcher usually immerses him- or herself in the research setting (Cloke et al. 2004). Though at times considered to be the equivalent of participant observation (Hart 't et. al 1996), ethnography overcomes the limitations of observation alone by welcoming other methods. Frequently these are interviews and the study of field-documents (Bryman 2008).

Ethnography gained widespread popularity in the 1920s through the works of the anthropologist Bronislaw Malinowski, who produced descriptive accounts of cultural practices of New Guinea's Melanesian populations by spending several years amongst them. From being viewed as the cornerstone of anthropology, in the decades that followed ethnography spread across disciplines, predominantly in the social sciences. This spread was accompanied by the rise of critiques and discussions on the merits and limitations of the approach and its method of participant observation (Bryman 2008, Van Maanen 1988). One of the main criticism of ethnography is that it does not produce generalizable conclusions (Goodson and Vassar 2011, Bryman 2008) based on 'real' (quantitative) data (Hammersley 1992). It is true that ethnography mainly produces qualitative (Geertz 1994) and site-specific (Goodson and Vassar 2011, Bryman 2008) data, but proponents of ethnography claim this is not necessarily a disadvantage. Some of them argue that research should be designed to optimise the understanding of the case rather than focus on generalisations (Stake 2003), or that ethnographic studies are essential features of inquiry in their own right (Geertz 1973: 14). Additionally, it can be argued that although a specific situation is

studied, it can provide hypotheses that can be tested in other contexts. In *What's wrong with ethnography?: Methodological explorations*, Hammersley (1992) states that generalisations can be made to other populations, but only when taking into account boundaries of generalisation. These boundaries are phrased by Spradley (1980) as place, actors, and activities. Clearly specifying these boundaries allows for empirical generalisations through ethnographic accounts (or hypotheses based on these empirical generalisations) to be made (Gomm et al. 2000, Hammersley 1992). As indicated in Chapter 3, the boundaries of the relevance of this research are largely formed by the Solomon Islands' categorisation as an LDC, SIDS, and PIC, and the focus on resilience in a disaster management context. Hence, the abovementioned critique, whilst legitimate, does not necessarily present an obstacle to ethnography informing my research approach. Although my research was not carried out with a primary focus of producing generalizable material, certain generalisations are presented in the conclusion of this thesis.

Additionally, ethnography is criticised on the basis of its ties to colonialism (Biolsi and Zimmerman 1997). Under this viewpoint, ethnography is essentially a colonisers' tool of exploitation and colonisation of people, with little consideration for ethics (Bryman 2008, Denzin et al. 2008). Questions like 'how should research participants be treated?' or 'is this research of any relevance to those researched?' were traditionally barely addressed in ethnography. This is at the heart of post-colonial criticism: legitimate criticism which I value and took into account when developing my approach to fieldwork. The following section addresses indigenous and decolonising methodologies, both as a way of addressing the post-colonial criticism on ethnography, and as an approach on its own.

4.2 Indigenous and decolonising methodologies

Similar to ethnography, indigenous methodologies advocate approaches aimed at documenting the realities of the research participants. Indigenous methodologies take this focus a step further by stressing the differences in realities of the developed world, to which the researcher often

belongs, and the realities of a developing context whilst emphasising the need to take these differences into account. Emphasising ethics, indigenous methodologies represent approaches and methods that are adapted to both the context of the researcher and the researched; they challenge the researcher's own inadequacies and misunderstandings, respect local systems of knowledge production, and follow local codes for communication and interaction (Denzin et al. 2008, Tuhiwai Smith 2005, Martin 2003, Huntington 2000, Sillitoe 1998). The reasoning for such a set of approaches is discussed in Denzin et al.'s *Handbook of Critical and Indigenous Methodologies* (2008), in which attention is drawn to critical indigenous inquiries of research, which should assign importance to cultural autonomy, and be ethical, participatory, and decolonising. Following a similar line of reasoning, decolonising methodologies, as addressed by Tuhiwai Smith (2005), emphasize the importance of ethics by addressing the negative connotation that research may have in former colonies, as research was frequently used as a tool for the colonisation of indigenous people and their territories. Ethical issues, she states, should not be 'prescribed in codes of conduct for researchers but (...) in cultural terms' (Tuhiwai Smith 2005: 119 - 120). Additionally, both indigenous and decolonising methodologies emphasize that research must have a purpose for both the researcher and the researched, and that research aims and methods must be understood by research participants as well as the researcher (Denzin et al. 2008, Tuhiwai Smith 2005). In sum, indigenous and decolonising methodologies stress that attention must be paid to mutual knowledge exchange and ethics related to cultural respect, whilst paying attention to power relations between the former coloniser and the formerly colonised (Porsanger 2004, Grenier 1998).

4.3 Shaping my approach to fieldwork

My location of research was a small-scale setting in which I wanted to analyse what the meaning and consequences of human actions in disaster management were in the eyes of the people living there. I looked for an approach enabling an understanding of the complex interconnectedness of relations, behaviour and actions, and meaningful structures through obtaining an understanding

of the context in which they make sense. Ethnography can enable such an understanding (Goodson and Vassar 2011, Hart 't et al. 2001, Geertz 1994). Considering the complex relations associated with Ghizo's ethnically diverse context, I welcomed the ethnographic approach in addressing my research questions. However, my research was not going to meet the foremost characteristic feature of Malinowski's 'traditional' ethnography: taking into account the time-restrictions of doing a PhD, I was not going to be able to spend several years in the field.[13] Furthermore, considering the retrospective aspect of my research, ethnography's main method of participant observation could not answer my research questions on its own, and other methods were needed. Committed to indigenous and decolonising methodologies' emphasis on ethics and knowledge exchange, I wanted these methods to be culturally-sound, inclusive, and following local codes for communication, as far as I, a person alien to the cultural context, could accomplish this. Hence I drew on both approaches, ethnography and indigenous and decolonising methodologies, to form an approach which enabled me to use ethnographic methods, welcome other methods, draw on the principles of indigenous and decolonising methodologies, and carry out months, not years, of fieldwork, covering four sites on Ghizo Island, not a single site as favoured in traditional ethnographic fieldwork.

As I could not carry out research over extended periods of time or study a cultural context as a whole, I turned to 'micro-ethnography'. This form of ethnography evolved out of the 'traditional' approach of ethnography in the 1960s when discussions on its merits and limitations opened up its interpretations. Micro-ethnography refers to the practice of researching and describing *aspects* of a culture or society, as opposed to the entire social system (Bryman 2008, Streeck and Mehus 2005). This can be done in a relatively short period of time and welcomes methods other than participant observation and interviews, as long as ethnographic methods and features are also adopted. This form of ethnography is more applicable to my field research as I focused on analysing the aftermath of a particular event, not on researching entire social systems. Marcus'

[13] I carried out three periods of fieldwork on Ghizo, totalling fifteen weeks: two-and-a-half weeks in spring 2011 (March-April), eight-an-a-half weeks in spring 2012 (April-June), and four weeks in spring 2013 (March).

(1995) discussions of 'multi-sited ethnography' further formed my use of ethnography, as my research addressed four sites on Ghizo. Marcus (1995) emphasises the use of traditional ethnographic methods in various locations, portraying connections among sites and bringing them into the same frame of study based on an experience shared between the sites. Framing the ethnographic aspect of my research as multi-sited micro ethnography allowed me to draw on certain aspect of ethnography whilst not meeting all criteria of the 'traditional' way of carrying out ethnographic research. My research was ethnographic in the sense that data was collected from a range of sources, using participant observation (further discussed in 4.4.1) and other methods that can be referred to as ethnographic methods: in-depth, semi-structured interviews (see 4.4.3) and analysis of field documents (see 4.4.4), and in the sense that the gathering and analysis of data involved the interpretation of meaning and consequences of human actions (mainly addressed in Chapter 7), the fifth feature of ethnographic research as mentioned by Hammersley and Atkinson (2007).

Indigenous and decolonising methodologies' emphasis on making the research purposeful in the local as well as scientific context shaped my approach to fieldwork in two ways. First, my initial visit to the Solomon Islands took place nine weeks after starting my PhD. In line with Van Teijlingen and Hundley's (2001) argument that exploratory field-visits fulfil a range of important functions, this first field-visit informed the topic of my research. The workshop[14] I attended during this visit brought to my attention the in-country demand for research documenting traditional coping strategies and risk reduction activities. I incorporated this demand in formulating the research questions, sub-questions A and C in particular, making them more purposeful for the context of research. Additionally, I spent time on Ghizo with islanders who had been affected by the 2007 earthquake and tsunami. They expressed frustration regarding how aid interventions had negatively influenced their lives. This informed sub-question B. Hence, not dissimilar to the process of grounded theory developed by Glaser and Strauss (1967), and detailed upon in

[14] The workshop was one of two workshops part of the scoping study 'Increasing Resilience to Natural Hazards (IRNH): Resilience to Volcanic and Tsunami Hazards within Indigenous Communities, Solomon Islands'. This workshop took place in Honiara, Solomon Islands on 30 and 31 March 2011.

Hammersley and Atkinson (2007), the knowledge gained during the first field-visit was used to develop research questions through taking into account the local interests and demands for research. Second, to generate more of a knowledge exchange rather than a one-way flow of information from research participants to researcher, I delivered two PowerPoint presentations in each of the four research sites during the second period of fieldwork. The topics addressed in the presentations were chosen based on the interests of the participants as identified in the first field visit.[15]

Indigenous and decolonising methodologies' emphasis on research ethics also shaped my approach in two ways. First, through Denzin et al. (2008) and Tuhiwai Smith (2005) stressing the importance of respecting local cultures and following their codes for communication, respect, and interaction. The importance of this was emphasised in the workshop on community resilience, in which Solomon Islanders drew attention to the need for researchers to engage with communities, not just to do 'quick and dirty research' (Chambers 1981: 95). My own learning about local cultural codes was facilitated by the first trip to Ghizo. As this visit was rather exploratory and I had no exact plan for research yet, I carried out participant observation and asked questions about what I observed. Interpreting what I observed in its wider cultural context was aided by Vallance's (2012, 2008, 2007) works on Melanesian research ethics and methodology. Making reference to indigenous methodologies, Vallance's (2007) discussion of a Melanesian research methodology provided valuable insights not only applicable to the Melanesian population of the country, but also largely to their Gilbertese counterparts. By detailing Franklin's (2007) Melanesian values such as land, *wantoks*, reciprocity, ritual, education and ancestors, Vallance (2012, 2007) provided me with a greater cultural understanding of the context in which my

[15] More information on the presentations is provided in sub-section 4.4.2. The full presentations are presented in Annex 1.

fieldwork took place[16], and hence allowed me to better respect that context and carry out my research in a more ethical way. Sub-section 4.4.1 provides more insight into this. A second way in which indigenous and decolonising methodologies' emphasis on ethics shaped my field research was through Denzin et al.'s (2008) emphasis on making sure that participants fully understand the research aims and methods used. The workshop on community resilience reinforced the notion that research participants often did not understand the purpose for which certain methods were being used and that they were therefore less likely to participate in research. Methods used should respect local participants and be ethical, participatory, understandable and accessible (Denzin et al. 2008). In search of methods addressing the research questions in such ways, Robert Chambers' participatory methods (e.g. Chambers 2002, 1994, 1992) came to my attention. Participatory methods are discussed in sub-section 4.4.2, which also discusses how they were used during the fieldwork.

Both ethnography and indigenous and decolonising methodologies informed my emphasis on investigating research participants' way of life and understanding their realities before attempting to derive explanations for their attitudes or behaviours. Goodson and Vassar (2011) and Spradley (1980) phrase this as an emic interpretation on information. Considering the ethnically diverse research context, this emic approach is welcomed here; without grasping how the contextual complexity influenced diverse ethnic groups' disaster management processes, no valid statements could be made on these processes. This is not to say that my approach to research is entirely emic- I am and remain an outsider to Ghizo and its people. Additionally, although I tried to grasp how research participants ascribed meaning, and perceived and explained their world, a researcher has the need at times to introduce an etic approach to interpreting data gathered (Pilch 2002). The bulk of the data analysis was undertaken as detached from the local context as

[16] Examples include: 1) Most people speak Pijin but cannot write Pijin. This was confirmed by Vallance (2008). Islanders from Ghizo stated this is because they are taught to write in English in school. Hence, when summarising and reporting back results of the participatory activities (see sub-section 4.4.2) I used English as the language of communication. 2) A man heavily apologised and offered me money after I told him I did not appreciate his advances towards me. Offering money is in line with Vallance's (2008: 3) mention of compensation: 'compensation is due to the person wronged and is to be paid by the person who has done wrong'.

possible, and according to academic guidelines. Hence the emic approach shifted to a more etic approach later in the research. Related to taking distance from the research setting through adopting an etic approach is the notion of reflexivity. My job as a researcher was to make sense of the research context in a way that is meaningful to the people in that context. With that job comes the responsibility of doing so in an accurate manner, and taking a step back and evaluating and rethinking my own behaviour was part of that. Acknowledging the interactions between the researcher and the researched is central to that, and with that comes the importance of reflexivity. I provide a more detailed account of reflexivity in section 4.6. First, the methods used in this research, which have been informed and shaped by ethnography and indigenous and decolonising methodologies, are discussed in the following section.

4.4 Methods

A variety of methods were employed at different times throughout the three periods of fieldwork (see Table 6). All are discussed in this section. I first explain what each method entails, subsequently addressing criticism levelled at the method. Following on from this, I discuss how the method was used in the fieldwork, and finally address its contribution to answering my research questions.

Table 6 Overview of methods used according to period of fieldwork

Fieldwork period	1 two-and-a-half weeks March-April 2011	2 eight-and-a-half weeks April- June 2012	3 four weeks March 2013
Methods used	-Participant observation	-Participatory methods in focus groups • Community profiles • Historical timelines • Mapping and ranking • Impact diagrams and pile sorting • Post-tsunami timelines • Cause and effect diagrams -Participant observation -Field document analysis	-Interviews -Participant observation

Sub-section 4.4.1 describes participant observation, a method used in different ways throughout the three fieldwork periods. The following sub-section, 4.4.2, discusses participatory methods as activities carried out in four focus groups: one focus group in each of the four locations of research. As mentioned in previous chapters, these are the Gilbertese villages of Nusa Baruka and Niu Manra, and Melanesian villages of Pailongge and Saegeraghi. Attention is also paid to the presentations delivered in the focus groups. Subsequently, the specific participatory activities carried out are discussed: community profiles, historical timelines, mapping and ranking, impact diagrams and pile sorting, post-tsunami timelines, and cause and effect diagrams. Sub-section 4.4.3 addresses in-depth, semi-structured interviews and topic-centred conversations, and field-document analysis is addressed in sub-section 4.4.4.

4.4.1 Participant observation

Participant observation refers to the process in which the researcher immerses him-/herself in the research setting by participating in the daily routine of the research participants. It relies on gaining a familiarity with a group and learning about their culture, by both observing and participating in their lives (Hart 't et al. 1996). Its aim is to grasp the world of the people among which the researcher spends his/her time, and to create an understanding of the rationales for their behaviours and actions.

I chose to use participant observation as a method as it allows for data to be gathered that could not be gathered through other methods (Becker and Geer 1957). For example, sensitive inter- or intra-group relations that may not be discussed in methods carried out in group contexts, or even in individual interviews, can be observed by taking part in the lives of research participants. I also chose to use this method to be able to carry out research in a more ethical way; by residing amongst the research participants, one can learn about their norms and values, and this knowledge can subsequently be taken into account in ways of interacting with research participants. Examples are provided throughout this section.

Before detailing how I used participant observation and what it brought to this research, I will briefly address how I dealt with some of its foremost critiques. Like ethnography in general, participant observation is frequently criticised for lacking breadth (Bryman 2008) and being subjective (Atkinson and Hammersley 1994). These are legitimate critiques when research relies heavily on participant observation, and hence strengthened my rationale for multi-method research. Furthermore, rather than taking in what I observed in a passive way, I frequently asked questions about my observations. Informal conversations resulting from this enabled me to embed what I observed in its wider cultural context. Although participant observation enhanced my understanding of the Melanesian and Gilbertese cultures, I am aware that I only have a snapshot of the cultures and cultural dynamics on Ghizo. I have only spent a limited amount of time on the island and in the country as a whole. Nevertheless I have learned certain aspects about the cultural dynamics that facilitated my research in many ways, enabling me to generate more reliable conclusions.

For the purpose of this research participant observation was mainly carried out in the role a 'participant-as-observer' (Gold 1958): not being wholly concealed, for this limits the depth and nature with which data can be gathered, and not being a complete observer. In terms of my role, I sought to find a balance between the two extremes of involvement and detachment. I carried out participant observation in Pailongge, Saegeraghi, Niu Manra and Nusa Baruka and Gizo town throughout the three periods of fieldwork on Ghizo (as listed in Table 6). I always made explicit who I was and with what purpose I was there, and participants were always informed of the nature of my presence. During the second and third period other methods (discussed below) were used as well. When carrying out other methods, participant observation had less of a focus on participation and more on observation. For example, I guided focus group activities, and after explaining the instructions I would observe the dynamics of how people went about the activities. It enabled me to learn about everyday interactions and values embedded in that particular context.

In the first field-visit, I carried out participant observation by staying in Nusa Baruka and Gizo town. A fellow researcher had provided me with the contact details of the Father of the Catholic diocese in Gizo town. I had contacted this person prior to arriving on Ghizo, and had arranged to stay in the church's guest house. The Gilbertese family I had met whilst walking through Nusa Baruka. We starting talking and had dinner together. As they once had an Australian person stay at their house, and enjoyed to interact with and learn from people outside their country, they invited me to stay in their house. Through staying with this Gilbertese family in Nusa Baruka and with Melanesian Solomon Islanders in the Catholic Diocese of Ghizo, I gained a first-hand understanding of the relations between these two ethnic groups. Spending numerous hours with both Gilbertese and Melanesian market-women at the market, the hub of Gizo town, increased my understanding of these relations. Through extensive conversations with the English-speaking Gilbertese family, I had the opportunity to learn some Pijin, which I further developed through small conversations with market women. This facilitated the speed with which rapport was built and research participants were approached during the next two visits.

During my second visit, I stayed with various families in Nusa Baruka, Niu Manra, Pailongge and Saegeraghi. Leading up to this, I explained to village committees, leaders or elders what my research was about, and asked for permission to carry out my research and stay in their village. As will be explained in Chapter 6 and 7, people who lived in one location prior to the tsunami, at times lived in different locations at the time of research. To reduce the risk of intra-community relations linked to this biasing the data gathered through participant observation, I stayed with families in different locations of the villages when possible. In Nusa Baruka, the family I first stayed with asked the village committee to meet and discuss with me what my research was about and where I could stay. After they had given permission for me to carry out my research, I asked if I could stay with one Gilbertese family in each of Nusa Baruka's five camps, which was arranged.[17] Five places were selected for me: some families had been asked if they wanted to host

[17] After the tsunami the original Nusa Baruka split up in five so-called 'camps'. Chapter 6 and 7 provide more information on this.

me, others had volunteered to do so. Four families were Gilbertese, one was mixed Gilbertese-Melanesian. In Niu Manra I was directed to one of the elders by a woman from Niu Manra who I had met at the pick-up truck going to Niu Manra. The elder gave me permission to carry out the research in Niu Manra Top (NMT)[18] and arranged for me to stay with his niece's family: a mixed Gilbertese-Melanesian family. Similarly, I asked permission in Niu Manra Site Sea (NMSS), where I had come to know the elder myself. Here, I stayed with a mixed Gilbertese-Melanesian family I had met whilst walking past their land, and who had invited me to stay. People from Pailongge, whom I had met at the market, were divided on whether I should ask permission to the village elder or to the United Church pastor. I decided to do both. They arranged for me to sleep in the church house. Additionally I stayed with two Melanesian families I had met at the market and via the focus group. Prior to arriving in Saegeraghi I had not established contact with its villagers. I went to the village and asked people who the village leader or elder was. I was directed to the village elder, and his nephew was summoned to translate between us. The elder gave me permission to do research and provided me with a place to stay with a Melanesian woman who had an extra room in her house for visitors to the village. To reduce the risk of intra-community relations biasing the data gathered through participant observation, I stayed with families in these difference locations.

I slept in the same places as the research participants did, took part in preparing food, consumed the same food as they did, attended ceremonies at the local churches, joined fishing expeditions, helped out with gardening. Some of these activities were more often carried out by men (e.g. fishing in deep water), but none were exclusively carried out by one gender group, which eased my participation in the activities. As most research participants used Pijin on an almost daily basis, it was commonly used as the language of communication when I was present. My language barrier was mainly restricted to church services, which were frequently at least partly conducted in a local language. Behaviour and interactions were again observed during hours spent on the

[18] Niu Manra Top is a part of the original village of Niu Manra that moved to a different location after the tsunami. Chapter 6 and 7 further detail this. The original site of the village is referred to as Niu Manra site Sea (NMSS). When referring to both parts, the name Niu Manra is used.

market in Gizo, on the transport pick-up trucks going back and forth between Gizo and the villages, and throughout the focus group activities (discussed in 4.4.2). The latter provided excellent opportunities to observe power dynamics at play: what are the group relations between men and women, how is respect for elders shown, who is more dominant and in what way, and how do others react to that? These observations provided me with an understanding of intra-community relations (addressed in Chapter 6 and 7), and guided the topics addressed in semi-structured interviews carried out during the last field visit.

In the third period I stayed in a guesthouse in Gizo town for health and safety reasons.[19] Participant observation was limited to the market activities in Gizo town and to the rides on the pick-up trucks. The majority of the daytime was spent in the various villages, carrying out in-depth interviews (see 4.4.3).

Participant observation provided me with an extensive amount of insight into the lives of the villagers. Followed up by investigation through direct questioning, it enabled my understanding of everyday practices. For example, I learned about showing respect, such as sitting cross-legged in the Gilbertese villages (see Figure 8), and not touching the skin of people from the other gender and not passing in front of people with a higher status in the Melanesian villages. These observations allowed me to carry out my research along ethical guidelines emphasised by indigenous and decolonising methodologies, and aided in building rapport and trust. I believe such relations facilitated and improved the way research was carried out, and therefore enhanced the quality of the findings presented in this thesis.

[19] The third period of fieldwork took place in the month of March. From about January to March the Equatorial Trough, a belt of low pressure that migrates between hemispheres, is usually found close to the Solomon Islands. The heaviest rainfall at most places occurs at this time. Roads on Ghizo were accessible but paths to the lower-lying parts of villages were flooded and higher areas were difficult to reach because of the mud. I stayed in Nusa Baruka for the first three nights, but due to the unhygienic circumstances of wading through thigh-high water littered with rubbish I stayed in a guesthouse in Gizo town for the remaining time of this fieldwork period. As discussed in 4.4.3, this actually had advantages with regard to the research methods employed during this period.

As participant observation was carried out four, five, and six years after the 2007 earthquake and tsunami, data gathered through this method contributed to answering all sub-questions. For example, the observed diversity in Melanesian gardens and the pride with which some Gilbertese families showed me their gardens, informed answering sub-question A and is addressed in Chapter 5. Another example, through participant observation it came to my attention that there were certain communication barriers in Niu Manra. Asking inhabitants of Niu Manra about this provided me with knowledge of conflict resulting from aid interventions. This contributed to answering sub-question B and is discussed in Chapter 6.

Figure 8 Showing respect in the Gilbertese culture
In the Gilbertese culture respect for others is shown by sitting cross-legged. Legs may be stretched when keeping them crossed but only when turning away from the people present in the same space- one's legs should not point in another person's direction.

4.4.2 Participatory methods: focus group activities

In the search for methods addressing the research questions in culturally-appropriate, understandable and accessible manners, Robert Chambers' participatory methods (e.g. Chambers 1994, 1988) cannot be overlooked. Chambers' participatory methods do not refer to a specific set of methods, but refer to methods characterised by the use of local products such as shells or sticks, and the absence of high-tech tools. They produce outcomes that are visible and tangible for both the researcher and the participants (Chambers 2010), can easily be carried out and

adapted to various contextual settings, and welcome the participation of all actors of a social setting, whether literate or illiterate, young or old, male or female. On this basis they are referred to as participatory methods:[20] everyone can participate, both in producing and evaluating the outcomes. These methods are very valuable in reducing the 'distance' between the research participants and researcher, particularly when the researcher comes from another cultural context. Though originally developed in relation to agricultural development work in India, Chambers' participatory methods are nowadays also adopted in disaster studies in several developing countries (Cronin et al. 2004).

However, as participatory methods gained recognition, so did the criticism on these methods. To mention some of the most foremost critiques, Cooke and Kothari (2001) argue that participation is not a straightforward matter but accounts for a variety of perspectives, and Hickey and Mohan (2004) and Mohan and Stokke (2000) claim that participatory methods merely draw the attention away from power relations between developing and developed nations. They argue that these relations frame development work, and that 'participatory development' is still owned by the developed actors as they choose the participatory methods and shape and direct the development process. Whilst legitimate, what these critiques have in common is that they are largely tied to the demands of development and development work in the sense of interventions in developing countries based on models of developed countries. The critiques emphasise that the developed world's repressive structures on what direction development should take, persist despite the use of Chambers' approach. However, my research is not development work in this sense. It can provide insight and advice to those working in development, but does not state what development should entail. Additionally, my use of participatory methods is shaped by the teachings of indigenous and decolonising methodologies, a field of studies which has also produced extensive critiques on participatory methods (Mohan 2000). By placing strong emphasis

[20] It is important to note that these methods are called 'participatory methods' on this basis; they are not called participatory in the sense of participants contributing to the development of the methods. However, as discussed in 4.3, the research questions guiding this research were informed by information gathered during my first visit to the Solomon Islands. As the methods used were guided by the research questions, the methods were in a way partly informed by Ghizo's villagers.

on ethics and making the research purposeful in a local and scientific context, I addressed the more general nature of the latter criticism. A more specific critique levelled at participatory approaches, and one that is also applicable to research outside a development context, is discussed by Cooke and Kothari (2001: 8) as the 'tyranny of participatory methods', or 'have participatory methods driven out all other methods which have advantages participation cannot provide?' By using methods other than participatory ones, this critique is no longer a valid one in the case of my research.

The participatory methods I used consist of six 'activities': community profile, historical timeline, mapping and ranking, impact diagram and pile sorting, post-tsunami timeline, and cause and effect diagram. All were carried out subsequently in a focus group, which was repeated in each of the four villages. Focus groups were chosen as a means of carrying out the activities as they are a form of group interview on a specific topic or issue, which places emphasis on group interaction as part of the method (Kitzinger 1995). This interaction can provide a more realistic account of what people think, as they discuss, think about, and possibly revise their views (Bryman 2008: 475). However, the opposite can also happen. In line with Smithson (2008) I found that some topics were not addressed in depth in a group setting. Like other methods, focus groups do not suit all research aims (Liamputtong 2011). I avoided topics that I knew to be of a sensitive nature and which should not be addressed publicly. Where possible I addressed some of these in more depth in individual interviews (see sub-section 4.4.3).

After having asked permission from the villages leaders, village committee, or elders to carry out a focus group in the respective village, I recruited participants through announcements of the focus group in church services and village meetings. Additionally I spread this information from door to door, which was a good way to get to know the people individually. The focus groups were carried out in weekends (two full days, roughly from 09:30 to 18:00 o'clock) in Nusa Baruka (5 & 6 May 2012), Niu Manra (2 June in NMSS & 9 June 2012 in NMT), and Saegeraghi (16 & 17 June 2012),

and in four evenings and one morning in Pailongge (evenings of 14-17 May 2012 & the Saturday morning of 19 May 2012); these days and times were chosen based on the preferences of the participants. As the focus groups were held either in weekends or evenings, work-related matters restricted people's participation only to a minimal extent. It must be noted that many people from NMT are not on speaking terms with people from NMSS, and vice versa (Chapter 7 will detail on this). To avoid asking people who do not want to talk to one another to come together, the focus groups in Niu Manra took place in two locations, and with predominately two different groups of people. The 2 June 2012 focus group took place in NMSS and the 9 June 2012 focus group took place in NMT. It is acknowledged that data produced in each of the two focus groups might be biased. To balance this, interviews were carried out with both people from NMT and NMSS. Other barriers to taking part in any of the focus groups were not identified.

In the Gilbertese villages the focus groups took place in the *maneabas,* in Melanesian Saegeraghi in the church house, and in Pailongge in a community 'house': a building without walls but with a roof supported by poles. They were generally attended by between 10 and 40 active participants (often the number of people was relatively low to start with and increased throughout the day), several others walking in and out, and many children. Men and women from all ages attended, but the majority of participants were between twenty and 55 years of age. Young adults (aged between 16 and 21 years of age) frequently participated in the activities, and I provided paper and markers to make drawings for children younger than 16 years of age who wanted to participate.[21] Alternatively they assisted in gathering local materials used in the activities. On

[21] The Open University's guidelines on 'ethical principles for research involving human participants' for participants under the age of 16, differ from those for participants over 16 years of age. The guidelines state that permission from the parents should be sought to involve those under the age of 16 in research. As this was not always possible (parents were not always around), I provided alternative activities for those younger than 16 years of age. During one of the focus group activities in Pailongge a group of teenage girls took part of which two girls were 15 years old. Their mothers were there and allowed them to participate.

average there were usually slightly more women than men attending the focus groups[22], and in all focus groups the oldest participants (over sixty years of age) were more often men, and the youngest ones more often women. In most cases the activities were carried out in two gender groups. I planned it this way to observe if there were differences in answers between men and women, and to prevent possible power dynamics between men and women influencing the activities. However, sometimes participants wanted to work together, and in a few other cases they did not feel comfortable expressing themselves in Pijin to me[23] but had no translator in their gender group.[24] In these instances men and women mixed. Overall, the data used in this research did not differ greatly between men and women. Power dynamics presented themselves in another way in one focus group: two people appeared to be more dominant than others.[25] I initially tried to address this by explicitly asking the less-dominant participants for their opinion, but they refrained from giving elaborative answers in the presence of the dominant participants. In order not to make people feel uncomfortable and create disharmony amongst the villagers (power differences are a very sensitive topic, as Chapter 6 will clarify), I had individual conversations at other times with the more quiet participants, or made sure at least some of them were interviewed during the last field visit.

No financial incentives were provided, but I arranged for food and non-alcoholic drinks to be served at the focus groups, partly to stimulate people to come, partly to prevent them from

[22] The focus group in Nusa Baruka started off with twenty adults (including young adults) (11 women and nine men) on day one, and ten adults (six women and four men) on day two. In Niu Manra there were 25 adults (18 women and seven men) present at the start of day one, and ten adults (seven women and three men) at the start of day two. In Saegeraghi there were nine men and three women at the start of day one, and eight men and four women at the start of day two. In Pailongge there were twelve women and five men at the start of the first evening, seven women and four men at the second evening, seven women and five men at the third evening, five women and six men at the fourth evening, and three women and five men on the morning of the last day.

[23] At times people who did not frequently speak Pijin, or who had relatively little education, felt their Pijin was not good enough to speak to me. In order not to make them feel uncomfortable I let the participants decide amongst themselves how they wanted to deal with the situation. At times this implied using a translator from the other gender group. In two cases (day one in Nusa Baruka, and one evening in Pailongge) this was a woman in a men's group, in one case in Saegeraghi a man in a women's group.

[24] Section 4.5 details further on using translators in parts of the focus group in Pailongge and Nusa Baruka.

[25] These power dynamics seemed to be based on level of education paired with the employment these people were involved in and the level of English they spoke: both people (one man and one woman) worked in Gizo town and were employed by (governmental and non-governmental) institutions concerned with the development of Ghizo Island.

leaving around lunchtime. In line with indigenous methodologies' emphasis on making the purpose of methods clear to participants (Denzin et al. 2008), I explained the purpose of the activity (without giving away too much information that might influence the outcomes) before starting the activity. After every activity we discussed what could be learned from it, and the lessons were summarised, written down (see Figure 9), and left with the village-committee or the main church. The physical outcomes of the activities were photographed to be able to further analyse them at a later stage. In the sub-sections below some of these photos are presented as examples of what the outcomes looked like.[26] Overall, research participants commonly mentioned how much the group activities had made them realise that they hold knowledge, and that they 'should work together as a community' (focus group Pailongge 16 May 2012).

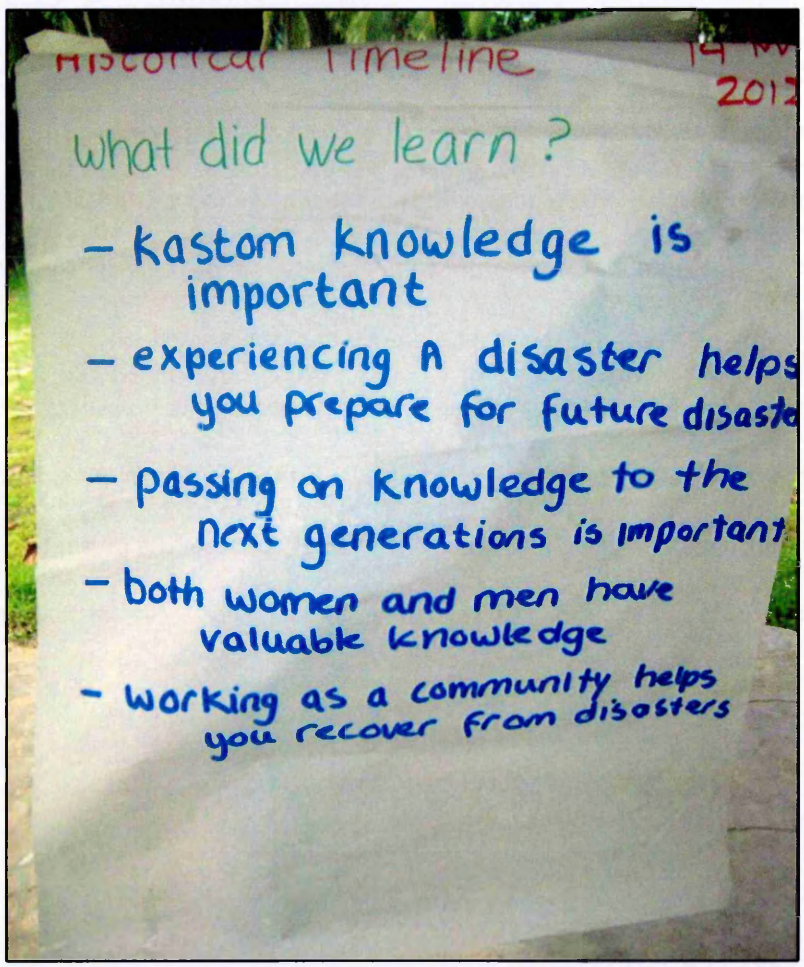


Figure 9 Lessons learned from creating a post-tsunami timeline in Pailongge
Source: Focus group Pailongge, 14 May 2012

[26] At this stage in the thesis the photos are merely illustrative. They are presented with the aim to give a general impression of the activity, and at times show written elements that may not be of a good enough quality to be read.

Although findings generated by the activities were welcomed by the participants, criticism of the extractive nature of research, levelled by critical, indigenous, and decolonising approaches, could still be considered valid as the participants of my research had not requested this research to be carried out. Hence, to balance the reciprocity of knowledge exchange slightly, I delivered two PowerPoint presentations (using a small laptop that I had brought with me) at the last day of each of the four focus groups (see Figure 10 and Annex 1). Both presentations were on topics of interest to the participants. Frequently observed during the first field visit was the misunderstanding of information on the earthquake and tsunami. In the years after the 2007 events people had received bits of information on the events (e.g. from NGOs and governmental institutions), but often did not understand what tectonic plates were and at times wondered if it had anything to do with 'plates for food' (Interview Tirza 12 March 2013). Hence, the first presentation explained what tectonic plates were and how the movement of the plates had caused the earthquake and the subsequent tsunami. Explaining how one plate was uplifted whereas the other subsided, made people understand why Simbo Island lost land and Ranongga Island gained land (see Chapter 2). The second presentation addressed the commonly expressed interest in phenotypical differences; it was frequently commented how some people in the country had rather straight hair and at times even blond hair. In this presentation I explained the role of Melanin in producing a darker or lighter colour of skin, hair or eyes. I used pictures of Solomon Islanders and my family to illustrate this.[27] Paper copies of the presentations were left in the villages.

[27] Family plays a central role in the Solomon Islands, and I was often asked about my family. Pictures of my siblings were therefore received with great enthusiasm.

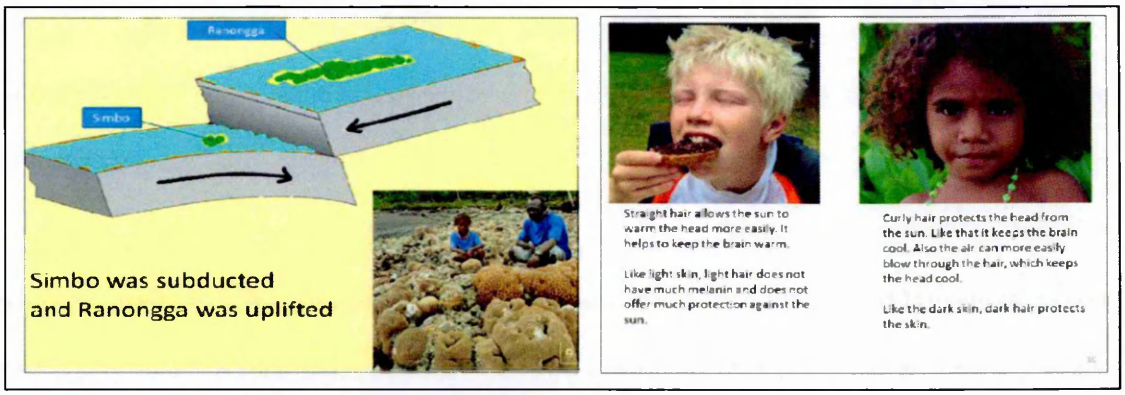


Figure 10 Examples of slides from the presentations
The slide on the left comes from the presentation on the movement of tectonic plates of the Solomon Islands, the slide on the right from the presentation on phenotypical differences.

The sub-sections below explain the focus groups' activities informed by Chambers' participatory methods.

4.4.2.1 Community profile

In each of the four focus groups participants created a profile of the group of people inhabiting their village who considered themselves a community prior to the 2007 events. I had selected the activity of creating community profiles with the purpose of generating a basic understanding of the inhabitants of the four villages, along with an understanding of the ways they did or did not display characteristics of a resilient community (as listed in Chapter 3), and possible changes in these characteristics between the period preceding the 2007 earthquake and tsunami and the time the focus groups were carried out (spring 2012).

The community profile activity was split up in two parts: the first part addressed a rather general profile, whereas the second part was more focused on indicators of resilience. Based on literature on the affected communities (e.g. McAdoo et al. 2009) and characteristics of resilient communities described in Table 5 I created two semi-structured lists of topics prior to this activity. The lists served as topic guides: the topics were open to discussion and were not questions with rigid answer boxes. Also, the lists were not all-embracing; additional conditions or criteria important to the participants were welcomed. In this way the creation of a community profile

allowed participants to add to, alter, or complement information already available in academic and grey literature. Hence, a more complete picture of the four groups of participants could be painted.

The more general community profile, was the first activity carried out in the focus groups[28], and was a good way to start the focus groups in a gentle manner before addressing at times more heavy topics relating to the impacts of the tsunami. It addressed topics of the first previously compiled semi-structured list: ethnicity, livelihoods, religion, education, water and sanitation, politics, and community feeling. This resulted in lists of data, of which an example is presented in Figure 11. In Nusa Baruka participants added 'housing', providing information on the categories of houses (permanent, semi-permanent, and leaf houses), and in Pailongge participants added 'people living near the sea' (as opposed to in the inland hills). The latter was a topic addressed in the list I had compiled for the second part of the activity as well.

[28] This activity was carried out in Nusa Baruka on 4 May 2012, in Pailongge on 14 May 2012, in Niu Manra on 2 June 2012, and in Saegeraghi on 16 June 2012.

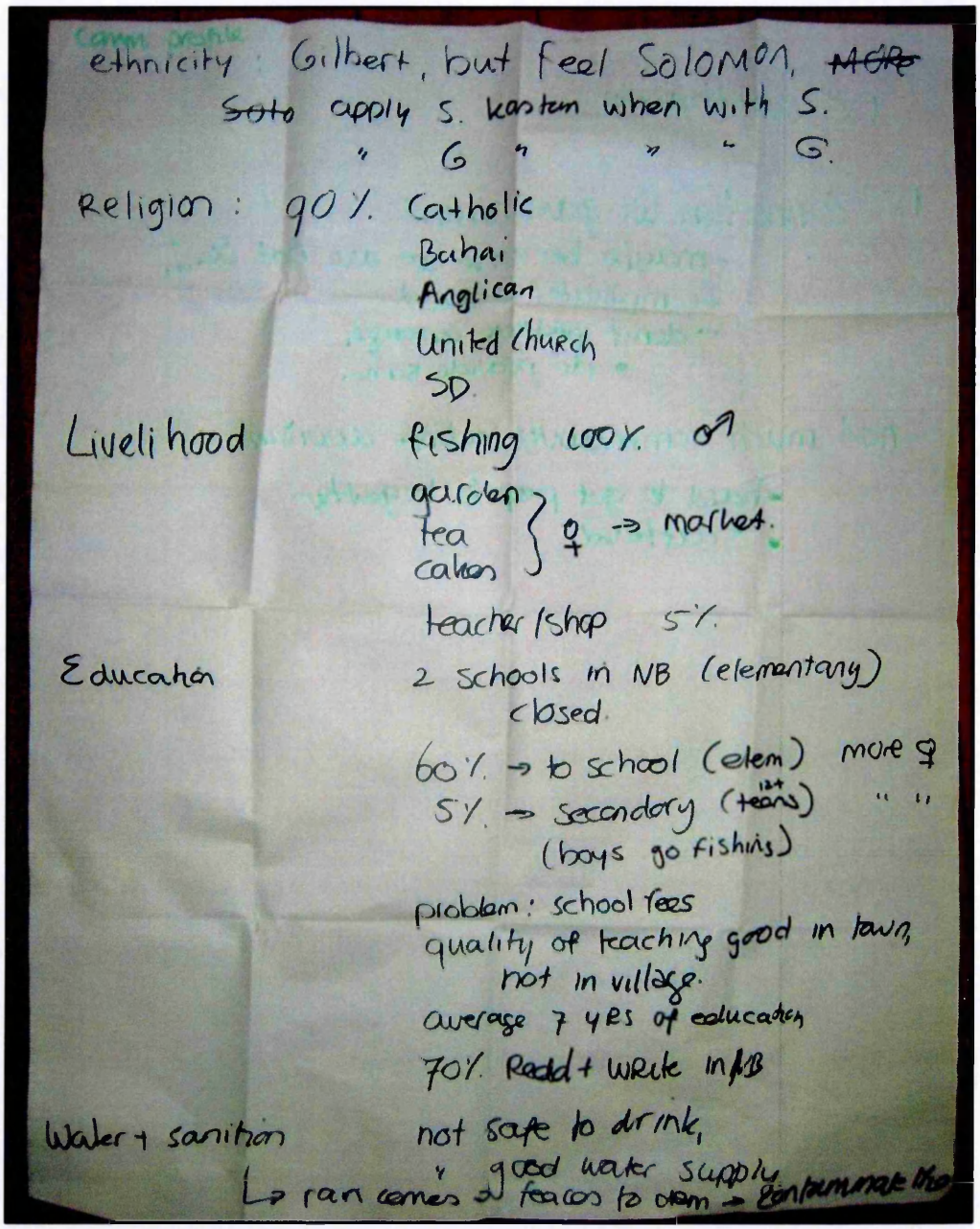


Figure 11 Community profile part 1: example from Nusa Baruka
After the tsunami the village of Nusa Baruka split up into five 'camps'. This community profile was made in the physical location of Nusa Baruka's Camp 1. Although people from other camps were present as well, the majority of people present were from Camp 1. Participant observation and everyday conversations served as a means of checking if these data were also applicable to other camps.
Source: Focus group Nusa Baruka, 4 May 2012

The second part took place at the end of the focus groups, as the last activity.[29] Participants discussed whether the specifics of the topics listed in the first part had changed much since the 2007 earthquake and tsunami, for example whether livelihood activities were different prior to

[29] This was carried out in Nusa Baruka on 5 May 2012, in Pailongge on 19 May 2012, in Niu Manra on 9 June 2012, and in Saegeraghi on 17 June 2012.

the earthquake and tsunami. Additionally, the second semi-structured topic list with characteristics of a resilient community was discussed. Topics listed were: livelihood diversification, initiative to save, store savings in a safe place, relation with government, trust in government, disaster preparedness, disaster response plan (including evacuation), emergency infrastructure, sharing experiences with next generations, population in coastal areas, equality in community, consciousness of protective environmental features, openness to change (with regard to adapting practices to increase resilience), attitude to disaster (god or natural phenomenon), connection to *wantoks*, religion and attending church. With the exception of Pailongge's participants adding that connection to family members, not only *wantoks*, is important, nothing was added. If participants felt the indicators were applicable to them, they specified if the ways these indicators applied to them had changed over the years since the 2007 hazards by placing a ↑ when indicating an increase (e.g. an increase in livelihood diversification), a ↓ when indicating a decrease. An S or 'same' indicated no changes. Indicators that were considered not applicable to the community were marked with a '-'. The number of people arguing 'increase', 'decrease', or 'same' was written down (see the example presented in Figure 12). Despite this exercise being about indicators of resilience, it must be noted that the word 'resilience' was not used (section 4.5 explains the reasons for this).

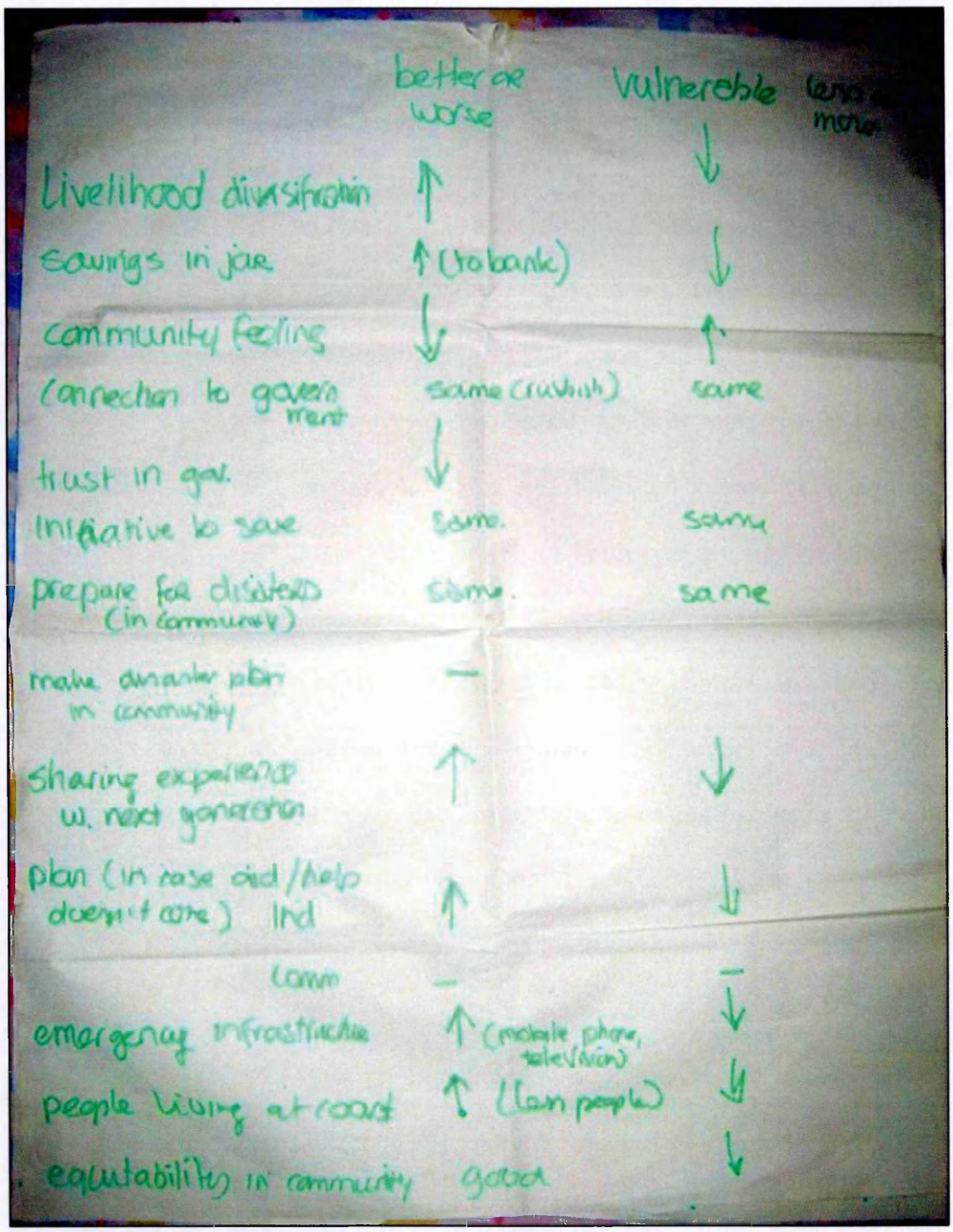


Figure 12 Community profile part 2: example from Nusa Baruka
Source: Focus group Nusa Baruka, 5 May 2012

By comparing the pre-earthquake and tsunami situation to the situation at the time of research, information on changes that occurred was provided. This contributed to answering the main research question and sub-question C. By discussing *how* particular changes occurred this activity also informed sub-question A and B. It was through this activity that attention was first drawn to the decline in community cohesion in all villages. It therefore contributed to further shaping the

exact focus of the research: community cohesion was addressed in more depth in one-on-one in-depth interviews (see 4.4.3) carried out in the last period of fieldwork.

4.4.2.2 Historical timeline

A historical timeline (see Figure 13) is an overview of important past events that happened in a community or impacted on a community. It is created by the research participants themselves and lists events important to them. These can be events that happened in the lifetime of those participating in the exercise, but can also have happened earlier in time. In the context of this research particular attention was paid to past hazards. According to Seyfang et al. (2010), Copp (2004), Schatzki et al. (2001), and Beck (1992) personal experiences of hazards influence personal interpretations of and attitudes towards hazards, and shape the knowledge used in living with hazards. Therefore, the creation of a timeline addressing hazards can aid in understanding changes in communities over time (Mercer 2009, Vrolijks 1998). Such changes could have influenced or shaped community resilience to the 2007 earthquake and tsunami. With this in mind, the activity of creating historical timelines was selected to be carried out in the focus groups.

Figure 13 Historical timeline: example from Pailongge.
From left to right the timelines created by the teenagers, men, and women.
Source: Focus group Pailongge, 14 May 2012

However, methods that rely on people's recall of the past are at times heavily criticised in quantitative research (Sharp 2006: 272). Although qualitative research in social science traditions is more comfortable with the use of recall data by drawing on memorable events (e.g. Anderson and Woodrow 1989), I believe

the data provided by such methods should still be cross-checked to ensure its accuracy. I have done so mainly by consulting literature.[30] It must also be noted though that the aim of this exercise was not to provide an all-inclusive overview of hazards that happened in the Solomon Islands, but to create an overview of those hazards that were of importance to the research participants. I therefore considered the creation of historical timelines a suitable method.

The historical timeline was the second activity in the focus groups.[31] It was a good way to gently introduce the topic of natural hazards without immediately addressing the disastrous impacts of the 2007 events. This activity was carried out by participants writing down past events on note-cards and placing the note-cards along a line indicating time. The end of the line indicated the year of research, 2012, the beginning of the line was represented by the date of the first entry listed by participants, which varied per focus group. The line was made with the use of local materials: sticks in Pailongge and Saegeraghi, drawn in the sand in Nusa Baruka, and drawn with chalk on the cement floor of the *maneaba* in Niu Manra. The activity was carried out by separate groups of men and women in Nusa Baruka, Saegeraghi, and Pailongge (the latter village had a third group: the teenage girls calling themselves the 'Lady Gagas', after the American singer-songwriter), and one group of women and men together in Saegeraghi.

The timelines were used to initiate discussions on which past hazards were seen as important and why, how they affected the communities, and what was done to deal with the effects. As part of these discussions, I asked the participants to answer three questions that I had formulated for each of the hazards they had listed:

[30] For example, in Pailongge an El Niño event was written down accompanied by the year 1997. In discussing the input participants said it was around 1997 but that it could have been 1996 as well. Literature research confirmed it was 1997.

[31] This activity was carried out in Nusa Baruka on 4 May 2012, in Pailongge on 14 May 2012, in Niu Manra on 2 June 2012, and in Saegeraghi on 16 June 2012.

I. How did you overcome the effects and pick up your lives again?

II. Did you or your community change any practices to make yourself less vulnerable to disasters of a similar nature in the future?

III. Did you revive any traditional practices or traditional knowledge to help you recover from this disaster or to make you less vulnerable to future events?

I had written down the questions in English and read them out both in English and in Pijin. Answers to the questions were discussed in the groups described above, after which each group chose a person to write down the answers (see Figure 14).

Figure 14 A young woman answers questions following the creation of a historical timeline in Niu Manra (NMSS)

Data generated throughout this process touched on disaster-subcultures, livelihood diversification, and disasters as an opportunity for learning and changing behaviour and practices. This contributed to answering the main research question and sub-question A in particular. Findings of this activity will be discussed more fully in Chapter 5.

4.4.2.3 Mapping and ranking

Participatory mapping (see Figure 15) is the process in which research participants create a map of the village or area they live in. Frequently this is done on a rather large scale, which facilitates participation as everyone can see what is being 'said' because it is being 'shown' (Chambers 1994a). In the context of this research participants were asked to create maps of what their village looked like before and after the tsunami (see Figure 15). This activity was chosen with the purpose of stimulating a discussion on factors enabling and/or disabling a safe escape from the tsunami, and therefore relating to resilience to the 2007 events. Additionally the maps were used to talk about physical priorities for recovery, as assets that are considered important within the culture of those affected are likely to deserve more attention in the recovery process (Schwartz 1992).

Figure 15 Participatory mapping: example from Pailongge
Representing the groups of men and women from Pailongge, Anne and Frederick place note cards on their pre-tsunami village-map. Other items shown on the map are: plantations of palm trees (yellow-and-green leaves), higher ground (stone-contour lines), road and bridges (made of twigs).

Mapping was the third activity in the focus groups.[32] The maps were created by using note cards and local materials such as twigs, grass, stones, shells, sand and leaves. There was an active role for children in gathering these materials. The local materials were mainly used to indicate features such as roads, the seafront, or gardens, whereas the notecards were predominately used to write down smaller assets like specific buildings or items such as radios. These cards were then placed on the maps. First villagers made a pre-tsunami map of their village. These maps showed assets of which several were directly linked to the actions and behaviours in the reactions and responses to the tsunami, for example phones for emergency communication. They also showed assets embedded in cultural practices, for example footpaths, leading to gardens, which were used to reach higher ground. Many of these were initially not explicitly linked to disaster management by the villagers, but when the pre-tsunami maps were used in discussing reactions and responses to the earthquake and tsunami these were pointed out.

The second step in the mapping activity was the ranking of physical priorities for recovery. This was done with the purpose of investigating whether aid received was in line with these locally identified priorities. The top three priorities for recovery were listed by men and women separately by placing one, two, or three candies at the identified priority (see Figure 17). Commonly identified priorities were the church, houses, water sources, and roads to restore access to the market. In discussions following the ranking of pre-existing physical assets, priorities for change were identified, often as a result of not having had certain assets that turned out to be important in coping with the immediate aftermath of the hazards. The third step in the mapping activity was the alteration of the pre-tsunami map to a map indicating the damage caused by the hazards. This was done by washing away the chalk used to draw the map in Niu Manra, covering the affected areas with sand in Pailongge, and simply by taking identified features and assets of the maps in Nusa Baruka and Saegeraghi. Subsequently the maps were rearranged to indicate

[32] This activity was carried out in Nusa Baruka on 4 May 2012, in Pailongge on 15 May 2012, in Niu Manra on 2 June 2012, and in Saegeraghi on 16 June 2012.

how the villages looked at the time the mapping activity was carried out, in 2012. The last maps were used to start discussions on what had changed and how these changes had occurred.

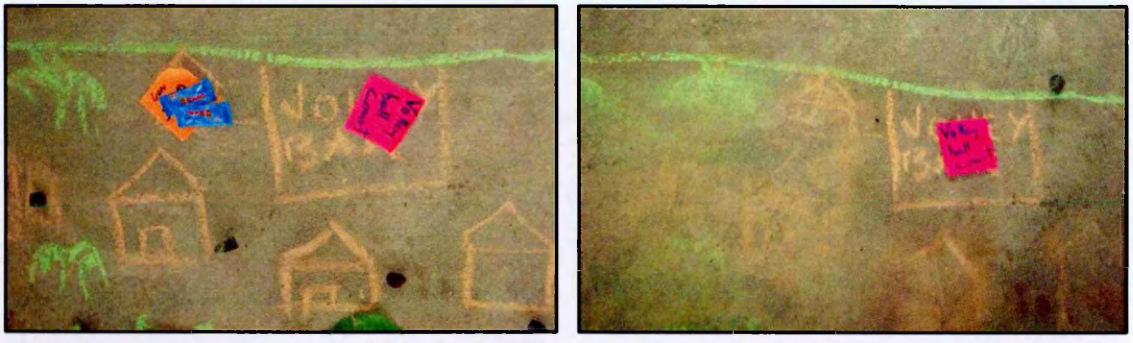


Figure 16 Mapping: example from Niu Manra (NMSS)
Part of the pre-tsunami map (left) shows the volleyball court indicated by the pink note-card and the houses surrounding it. On the map representing the damage caused by the hazards (right) the volleyball court is still there, but the surrounding houses have been washed off the map.
Source: Focus group Niu Manra, 2 June 2012

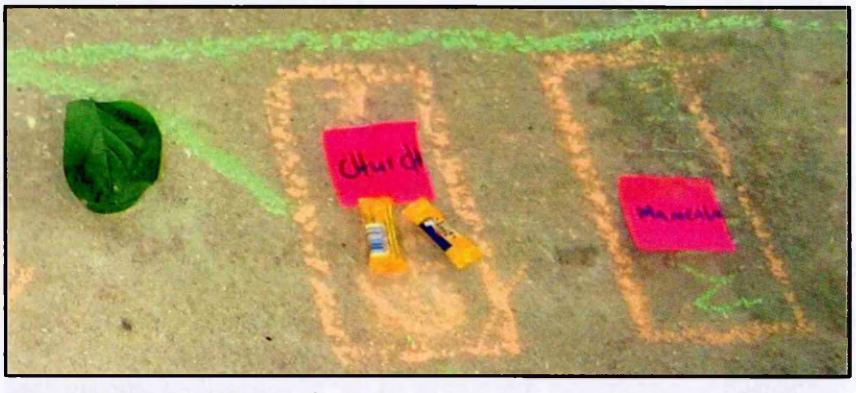


Figure 17 Ranking priorities for recovery: example from Niu Manra (NMSS)
The two yellow candies indicate that the church as listed second in the women's list of priorities for recovery.
Source: Focus group Niu Manra, 2 June 2012

Data generated throughout this process related to physical factors facilitating and constraining initial reactions and responses, as well as it addressed communities' states of recovery five years after the events. The data produced therefore contributed to answering the main research question, and sub-questions A and C in particular. Findings of this activity are part of the analysis in Chapter 7.

4.4.2.4 Impact diagram and pile sorting

An impact diagram (see Figure 18) is an overview of the causal impacts of an independent variable on other, dependent, variables. It is often used to identify and illustrate the negative and positive, and direct and indirect impacts of an event. Such impacts can be tangible or intangible, intended or unintended, and can vary in scope and over time. Impact diagrams provide insights into inter-linkages between direct and indirect effects and reasons for change, argues Kumar (2002: 201). Therefore impact diagrams can aid in understanding how certain processes affected long-term recovery and change, possibly with regard to characteristics of resilient societies.

The impact diagram was the fourth activity carried out in the focus groups in Pailongge, Saegeraghi and Nusa Baruka. In Niu Manra it was the fifth activity and was preceded by the post-tsunami timeline (see 4.4.2.5). The impact diagram proved to be a rather time-consuming activity, and as several participants were pressed for time when the first day was coming to an end, this activity was swapped with the first activity of the second day.[33] In the other villages, it smoothly followed the mapping activity, in which the damage caused by the tsunami was mapped. The impact diagram activities started by placing a notecard with the words '2007 earthquake and tsunami' (or something else representing the tsunami) on the floor. Participants were then asked to identify how the earthquake and tsunami had impacted them, and were asked to indicate whether these were positive or negative impacts, and primary or secondary. As the difference between primary and secondary impacts was not always clear to the participants, I paid considerable attention to explaining this difference by using examples not related to the hazards. Subsequently participants identified impacts amongst themselves and mostly had one person write down the impacts on note cards. With twigs, sticks and long leaves the relation between the hazards and the impacts was indicated, separating out primary (directly linked with a twig to the hazards) and secondary impacts (linked to a primary impact with another twig). In Niu Manra, Nusa Baruka, and Pailongge listing the impacts was carried out separately by men and women,

[33] This activity was carried out in Nusa Baruka on 5 May 2012, in Pailongge on 16 May 2012, in Niu Manra on 9 June 2012, and in Saegeraghi on 16 June 2012.

but the diagram was created in a joint manner. In Saegeraghi men and women worked together throughout the whole activity.

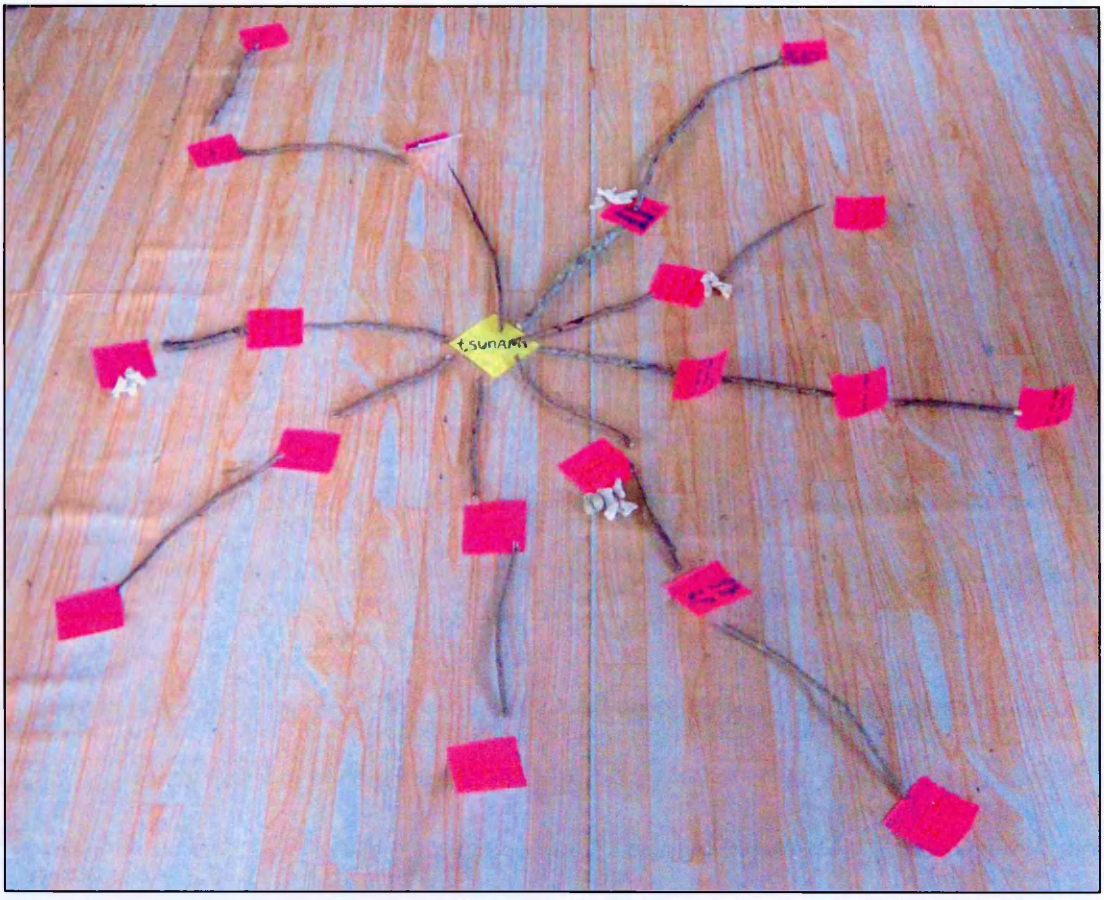


Figure 18 Impact diagram: example from Saegeraghi
Source: Focus group Saegeraghi, 16 June 2012

The second step of this activity was pile-sorting (see Figure 19). Chambers (2008) describes pile sorting as the process in which participants receive a fixed number of stones or other locally available materials to be distributed among the criteria identified through earlier activities. The more items are piled at one criterion, the more important this criterion is. In this case the criteria were the impacts identified. Pile sorting was done for both the negative and positive impacts identified. Pile sorting for the negative impacts, and the discussions following this process, was partly used as a means of triangulation of the recovery-priorities identified in the mapping exercise. Pile sorting the positive impacts was something I valued with regard to not only discussing the negative aspects of the events but also possible positive ones. Additionally, the discussions on the positive impacts provided me with more specific data on long-term recovery

and change. Participants at times expressed that they found it difficult to indicate the differences between primary and secondary impacts, but it appeared the activity was commonly considered an interesting activity. In Saegeraghi, for example, participants asked if they could extend the impacts and include tertiary impacts. They were so proud of their 'spider' (Figure 18) that it remained on the floor of the church house for several days. In Niu Manra it was explicitly stated that this activity was 'an insightful process that reminded us that the tsunami not only brought negative changes but also positive ones' (focus group Niu Manra, 9 June 2012).

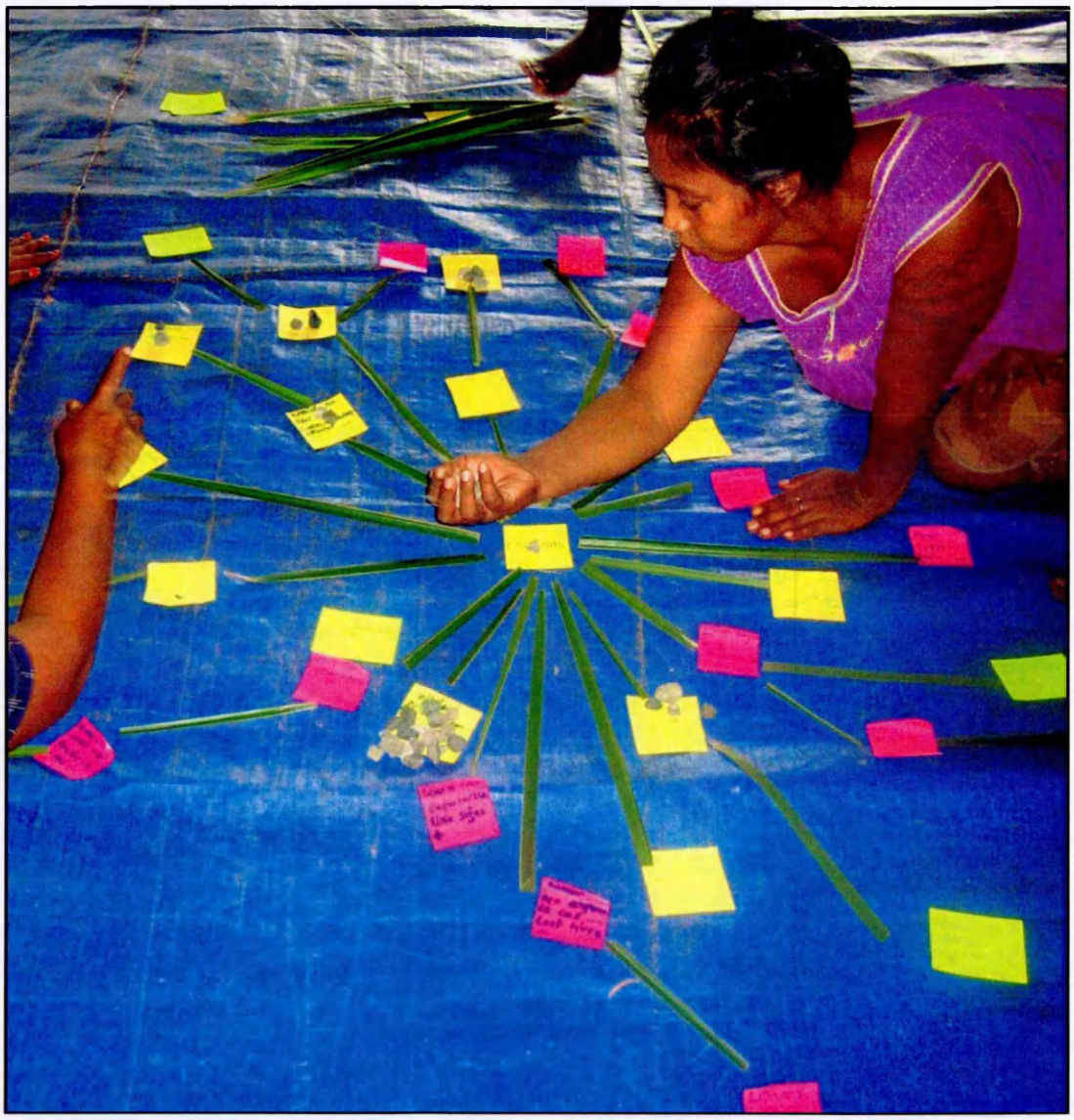


Figure 19 Pile sorting negative impacts identified through the impact diagram: example from Niu Manra (NMT)
The centre of the diagram represents the tsunami-event, the yellow (men's) and pink (women's) cards the direct and indirect effects. '+' and '-' on the cards indicated whether the impacts were considered negative or positive. Stones were placed on the impacts to indicate the importance of the impact.

Data gathered through mapping and pile sorting touched on all processes occurring in the aftermath of the hazards, which contributed to answering the main research question and all sub-questions, in particular sub-questions B and C. Data from this activity will be followed up in Chapters 6 and 7.

4.4.2.5 Post-tsunami timeline

Similar to historical timelines, post-tsunami timelines list important events in history, only the focus here was on the years after the tsunami (2007-2012). This activity was carried out with the aim of finding out more about important events and happenings in the disaster management processes, and if or how these events were related to possible changes in characteristics commonly ascribed to resilient societies. The timeline was also used to inquire about which phases in the disaster management process participants distinguished, and what characterised these phases.

The post-tsunami timeline was the fifth activity in Pailongge, Saegeraghi and Nusa Baruka, and the fourth activity in Niu Manra.[34] Similarly to the case of the historical timeline, a line was drawn or created from twigs, and note cards were placed along it as entries to the timeline (see Figure 20). The cards were grouped according to the year in which the entry listed took place. In all villages men and women discussed and wrote down entries in separate groups but chose to combine the cards in one timeline. The provision of aid from various sources and in various ways dominated events listed in this timeline.

The creation of the timelines was followed by discussions on the provision of aid. In each focus group participants discussed and communicated their opinions on governmental and non-governmental aid organisations and the aid they provided. Based on this they made an overview of organisations that were present, and indicated whether they evaluated them as predominately

[34] This activity was carried out in Nusa Baruka on 5 May 2012, in Pailongge on 17 May 2012, in Niu Manra on 2 June 2012, and in Saegeraghi on 16 June 2012.

positive or negative and what the reasons for this were (see Figure 21). In some cases organisations were listed as both positive and negative.

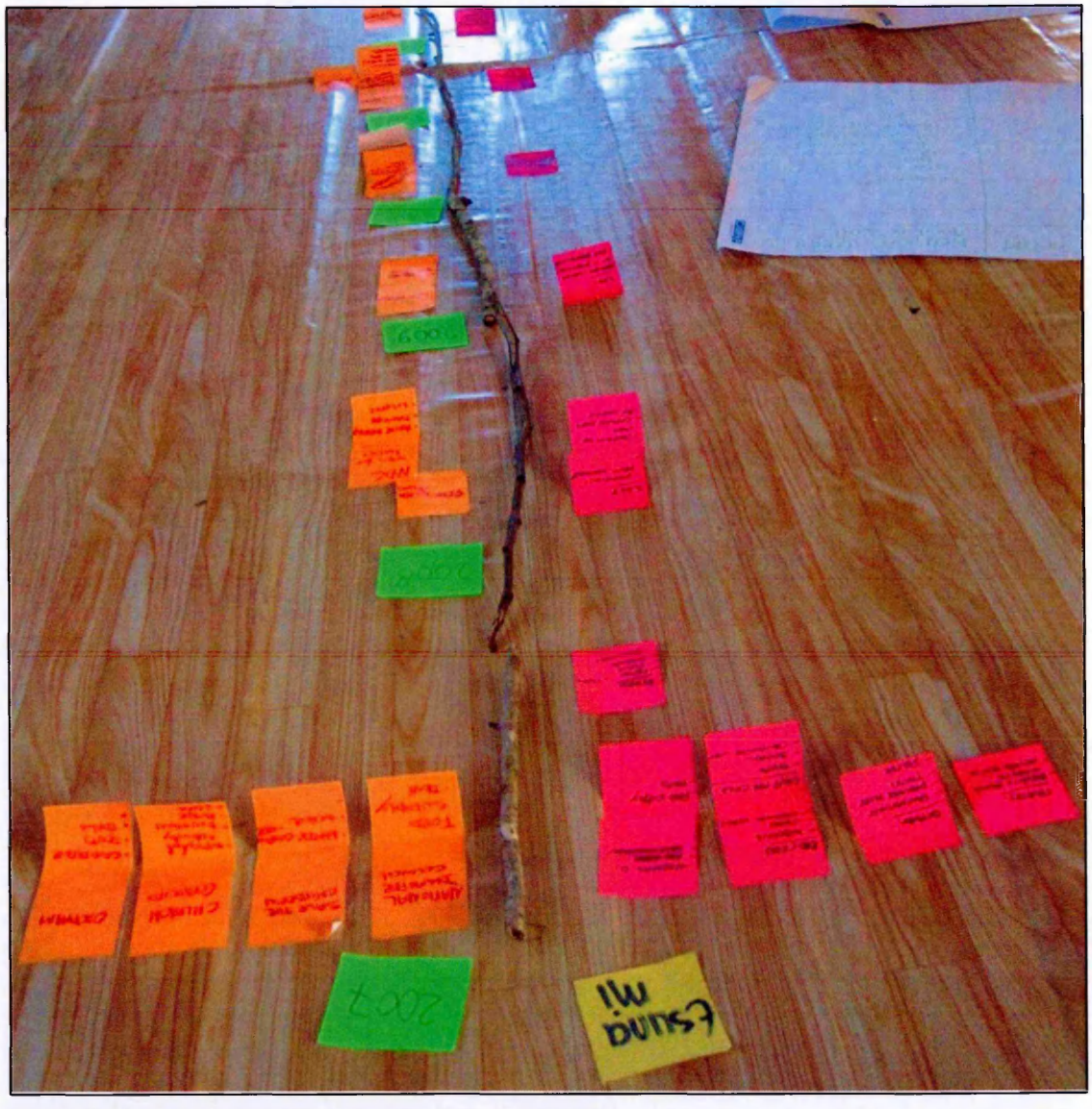


Figure 20 Post-tsunami timeline: example from Saegeraghi
The entries on the orange cards are the men's, the pink ones the women's.
Source: Focus group Saegeraghi, 16 June 2012

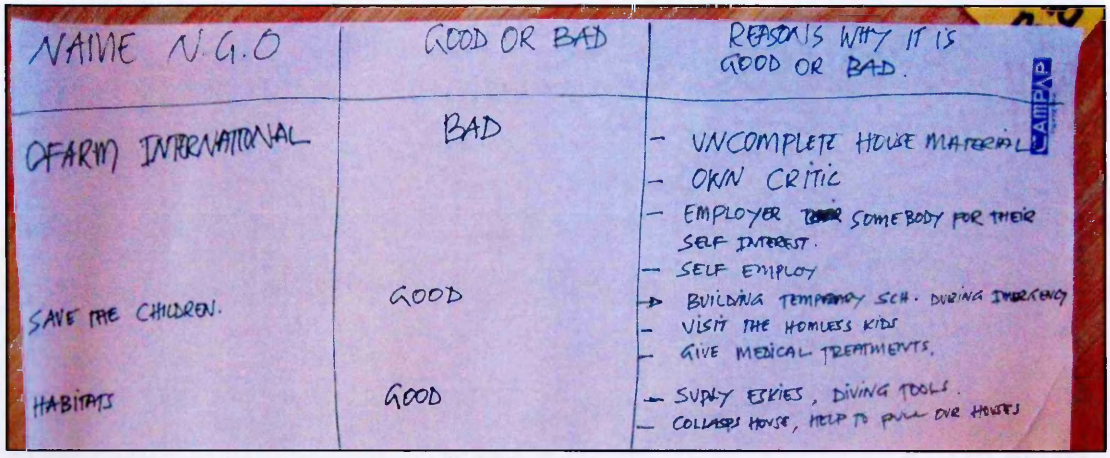


Figure 21 Comments on aid organisations: example from Saegeraghi
Oxfam (spelled by participants as Ofarm) received extensive comments as it was the main organisation responsible for the response and recovery interventions on Ghizo.
Source: Focus group Saegeraghi, 16 June 2012

Factors participants listed for judging aid as positive or negative were centred on the nature of the aid, the needs assessments carried out, the distribution of aid, and the people employed by the aid organisations. This data contributed to answering sub-question B of the research questions, and is mainly explored in Chapter 6. In addition this information contributed to answering sub-question C, which is largely addressed in Chapter 7.

4.4.2.6 Cause and effect diagram

A cause and effect diagram, causal flow chart or causal analysis diagram, is a suitable way to identify causes and effects of a particular issue (International HIV/AIDS Alliance 2006: 82). In the context of this research it was used to gather data on what participants identified as factors that had influenced their recovery process (the 'causes'), followed by how these factors had influenced this process (the 'effects'). It was very much linked to the post-tsunami timeline, as many factors identified were aid organisations. It was also similar to the impact diagram in the sense that it shows relationships and linkages. Hence this activity largely served as a way of triangulating or expanding on data gathered through earlier activities.

The cause-effect diagram was the sixth activity carried out in all focus groups.[35] In Niu Manra women and men made two separate diagrams, in Pailongge and Saegeraghi men and women chose to make the diagrams together, and in Nusa Baruka participants split up in two groups of women and one group of men and women to discuss the inputs, but made the diagram together. Participants were first asked to think about factors (causes) that influenced their recovery. I emphasised that both positive and negative factors could be listed, and that the factors could be intrinsic or extrinsic to their village. I asked them to write down their entries on note cards and to place the note cards in cells A (negative) and B (positive) (see Figure 22), moving them further to the outsides of the cells if they were very positive or negative, and further towards the centre if they were positive or negative in a less strong way. Entries that were seen as both positive and negative were placed on the line separating cell A and B.

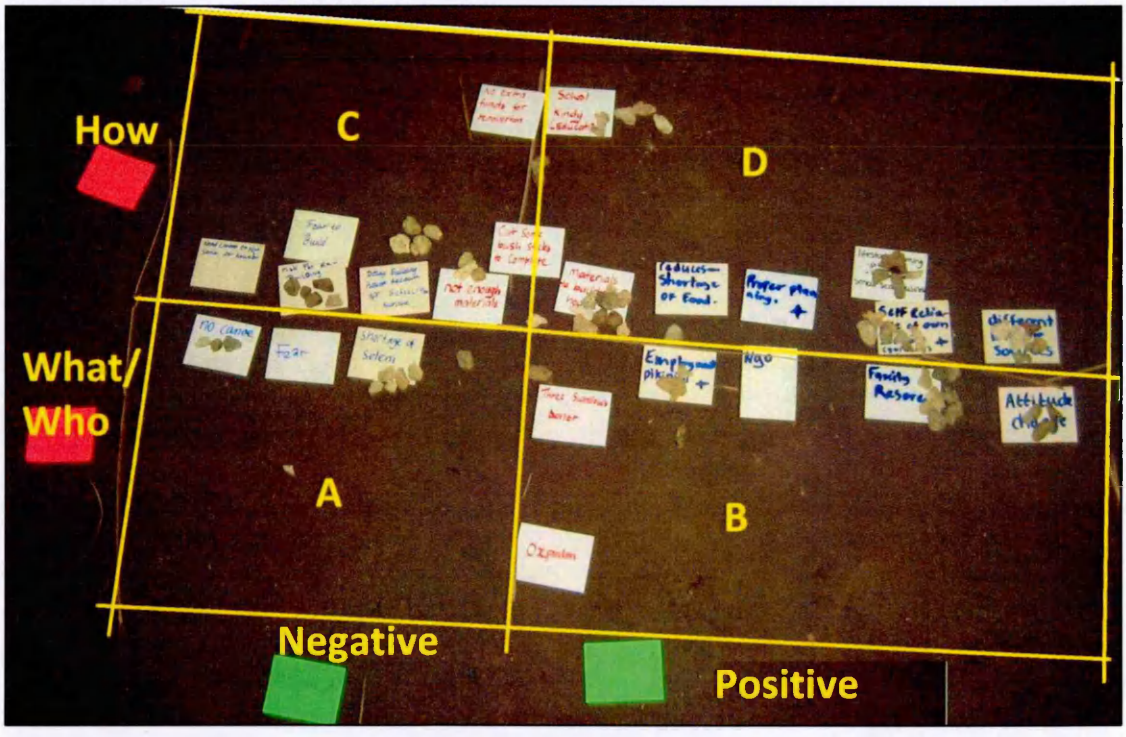


Figure 22 Cause and effect diagram: example from Nusa Baruka
This figure shows the cause and effect diagram made in Nusa Baruka. For explanatory purposes the categories' labels and lines are accentuated by 're-drawing' them onto the picture. Note that certain entries in cells A and B are positioned close to the line separating these two cells.
Source: Focus group Nusa Baruka, 6 May 2012

[35] This activity was carried out in Nusa Baruka on 6 May 2012, in Pailongge on 19 May 2012, in Niu Manra on 9 June 2012, and in Saegeraghi on 17 June 2012.

Next participants were asked to identify how these factors shaped their recovery process (effects). These entries were listed in cells C (negative effects) and D (positive effects). Some causes were connected with both positive and negative effects. Similar to the impact diagram, pile-sorting was used to identify the most important positive and negative causes and effects in the eyes of the participants (see Figure 23). Both the male and the female participants received an equal number of stones or coral pieces to do so. The pile-sorting was followed by discussions, involving all participants, on why the causes and effects were listed, and why some of them were considered more important than others. Input frequently referred directly or indirectly to the actions of aid interventions. Data produced by this activity was therefore also brought up in interviews with staff from aid organisations (see 4.4.3).

Data gathered through this activity touched on all processes occurring in the aftermath of the hazards. This contributed to answering the main research question and sub-questions B and C in particular. Data from this activity will therefore be followed up on in Chapters 6 and 7.

Figure 23 Cause and effect diagram and pile sorting: example from Nusa Baruka
The male participants are rating the most important positive causes and effects according to them. The women are waiting for their turn to place down their stones.
Photo credit: 'Spiderman'

4.4.3 In-depth semi-structured interviews and topic-centred conversations

In-depth interviews are a type of interview frequently characterised by having open-ended questions and a semi-structured format. They are carried out according to a list of fairly specific

topics, often referred to as an interview guide, whilst the interviewee has a great deal of freedom in how to reply (Bryman 2008: 438). These types of interviews are more flexible than structured interviews, and allow interviewees to explain and add to questions posed by the interviewer. They are often used to explore the respondents' feelings and perspectives (Guion et al. 2011). Particularly with regard to the latter, I chose this method as a means to investigate further the sensitive issues relating to community-relations and the aid interventions following the 2007 earthquake and tsunami. I learned of the existence of these issues during the second period of fieldwork, but group methods were not the right means to inquire about the issues in greater depth. In addition, time, as a factor contributing to the strength of relations I developed with research participants I had met at the first of second visit, aided in building rapport. It felt more appropriate to inquire about sensitive issues during my last field visit. In line with indigenous methodologies' emphasis on local codes for communication and interaction, I preferred semi-structured interviews over more structured ways of interviewing individuals as they more easily allow for interviewees to express themselves in ways and means they prefer, rather than having to fit their answers in categories designed by the researcher.

In total I carried out 22 in-depth interviews with individuals in the third period of fieldwork, of which the 18 interviews with survivors of the 2007 earthquake and tsunami living in Saegeraghi, Pailongge, Nusa Baruka and Niu Manra. Annex 2 shows the interview schedule. In accordance with the Open University's Ethics Principles for Research Involving Human Participants, I had developed a participant information sheet. With each interviewee I went over the sheet by reading its text out loud. I also addressed the consent form in this way. I chose this approach over presenting the interviewees with the written version of the documents, and asking them to confirm their consent by writing, as some interviewees were illiterate or semi-literate. Informed consent was recorded on the audio-recordings of the interviews.

I tried to account for gender and age differences by asking men and women of various ages if they liked to be interviewed. I interviewed one woman and three men in Saegeraghi, four women and two men in Pailongge, two women and two men in Nusa Baruka, and three women and one man in Niu Manra. These interviewees ranged in age from nineteen to seventy years old. In these interviews I most often asked the questions in Pijin and people answered in Pijin. In a few cases a mix of Pijin and English was used. Additionally, I carried out interviews with representatives of aid organisations involved in the aid interventions after the 2007 events. These interviews predominately concerned the aid organisations' roles in the aid interventions. I mainly asked about this to cross check data on aid interventions produced in the focus groups and to gather the organisations' views on the problems associated with aid interventions as expressed by the villagers. The four interviews were carried out with representatives of the Solomon Islands National Disaster Management Office (NDMO), Solomon Islands Red Cross, Save the Children, Oxfam, and World Vision. To these organisations I posed the questions in English, as this is the official language in which these organisations operate in the Solomon Islands. The interviewees frequently switched back and forth between English and Pijin. All interviewees are listed in Table 7, along with a brief explanation of how I encountered them.

Table 7 List of interviewees
With the exception of Emma, none of the interview participants from Ghizo who I met through ways other than the focus groups, participated in the focus group.
Note: for privacy reasons most names are pseudonyms.

Interviewee	Sex	Village/City	How I encountered them
Hank	M	Pailongge	Via the focus group
Anne	F	Pailongge	Via the focus group
Marie	F	Pailongge	On the market
Tilda	F	Pailongge	On the market/Via the focus group
Angela	F	Pailongge	On the market
Edison	M	Pailongge	Other people in the villages directed me to him
Charles	M	Saegeraghi	Other people in the villages directed me to him
Joelle	F	Saegeraghi	Via the focus group
Peter	M	Saegeraghi	I met him whilst walking past his garden
Gabriel	M	Saegeraghi	Other people in the villages directed me to him
Mack	M	Nusa Baruka	I met him whilst walking past his land
Tom	M	Nusa Baruka	Other people in the villages directed me to him
Madelyn	F	Nusa Baruka	I met her via another research participant
Anita	F	Nusa Baruka	Via the focus group
Tirza	F	Niu Manra	I met her whilst walking past her land
Arthur	M	Niu Manra	I met him via his wife
Jean	F	Niu Manra	Via the focus group
Emma	F	Niu Manra	I met her whilst walking past her house
Rex	M	Human security officer, Oxfam, Honiara	I contacted the organisation
Lorimo	M	Disaster management coordinator, Solomon Islands Red Cross, Honiara	I contacted the organisation
Andrew	M	Country manager, World Vision, Honiara	I contacted the organisation
Ruthie	F	Volunteer assessment team, NDMO, Honiara	I contacted the organisation

It is important to note that I stayed in a guesthouse in Gizo town for the duration of this last period of fieldwork. As mentioned in 4.4.1 this was initially decided for health and safety reasons. However, quite early on in this last fieldwork period I realised that the sensitive nature of social relations in combination with interviewing individuals, not groups, made people question why I was spending more time with person X than with person Y, and whether person X would criticize them. Considering this, I stayed in the 'neutral' location of Gizo town instead of with families in

the villages. The interviews were held in a location of the interviewee's preference; sometimes this was their home, other times it was in Gizo town.

In addition to the semi-structured in interviews and the random conversations that are part of fieldwork in general, I carried out short topic-centred conversations with fourteen people (four men and ten women) I encountered on the road when walking from Niu Manra to Saegeraghi, passing the village of Pailongge, on 13 June 2012. Right there and then, on the side of the road, I had brief conversations with them on locally relevant knowledge of hazards. Chapter 5 addressed these conversations. The data gathered through the semi-structured interviews is largely addressed in Chapter 6 and 7 as this data contributed to answering sub-questions B and C in particular.

4.4.4 Analysis of field documents

Analysing field documents is frequently seen as a method that can be carried out as part of ethnographic research. In such cases it is often 'qualitative document analysis' that is referred to, which involves tracking discourse, words, meanings and themes (Altheide et al. 2008). I analysed field documents not with the aim of looking for particular meaning in written narratives, but in a sense of examining the information presented in these documents in relation to data gathered via other methods. I examined the documents and made a record of topics that were of particular relevance for my research.

The field documents analysed were reports by organisations involved in the aid intervention related to the earthquake and tsunami, and concerned reports which were not available online, and which I had not been able to retrieve despite e-mail contact with organisations involved in the aid intervention. I literally came across these documents 'in the field'. The NDMO presented me with several electronic copies of documents, ranging from initial damage assessments written in May 2007, to the findings of a 'Lessons Learnt workshop', conducted in June 2007 to provide

Solomon Islands based organisations with an opportunity to exchange information on their responses to the disastrous events, and to a so-called 'recovery action plan' compiled in November 2007. Additionally, Oxfam Solomon Islands provided me with an evaluation report, produced in November 2007, detailing the organisation's response to the events. However, it was an Oxfam report shown to me by villagers from Niu Manra (NMT) that was one of the most relevant documents I came across. This was a report titled 'Post-tsunami water and sanitation recovery and rehabilitation Program', compiled by Oxfam International in December 2007 (see Figure 24). This document provided me with insights into the affected villagers' perspectives on the aid intervention in 2007, and served as a good means of comparing those perspectives to the ones research participants presented during my research.

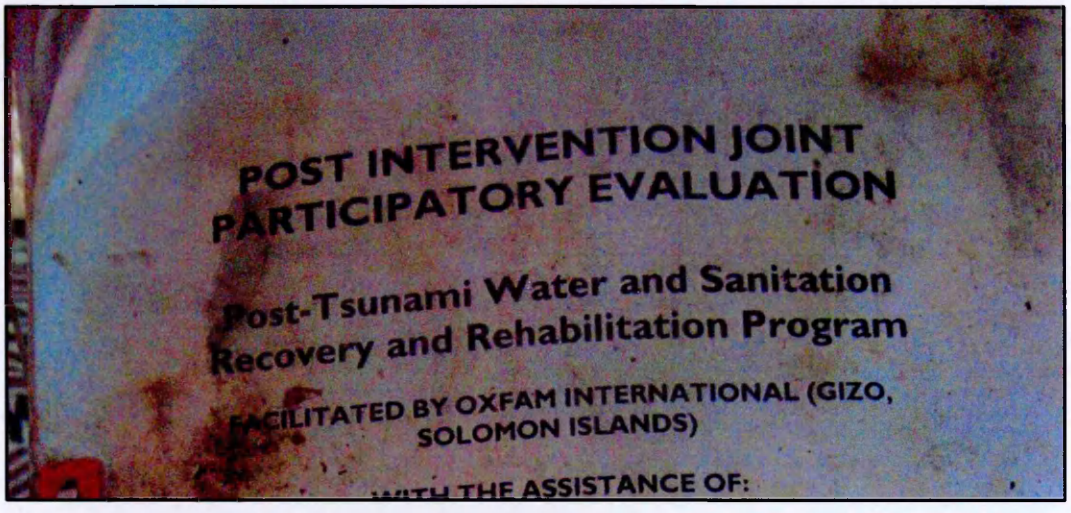


Figure 24 Part of the field document presented in Niu Manra

Overall, it can be stated that analysing the documents at times aided the process of gathering data in the focus groups by providing me with a preliminary understanding of certain topics. For example, one of the documents provided by the NDMO listed several NGOs that had been involved in the organisational disaster response. This aided me in asking tailored questions about NGOs identified in the post-tsunami timeline exercise, or the absence of these NGO in the timeline. At other times documents presented me with the opportunity to verify information expressed in the focus groups and interviews, but that I had not been able to verify in other ways. For example, the Oxfam document presented to me in Niu Manra contained data indicative of

survivors' dissatisfaction with the ways aid interventions were carried out. I have not been able to find evidence of this type of criticism in publically available reports. In general, the field documents contributed to answering sub-question B of the research questions.

4.5 Language and translation

The issue of translation deserves attention in this thesis. As indicated, during some occasions in the focus groups, translators were used. I had made agreements with translators for the first days of the focus groups in Nusa Baruka and Pailongge- the first two villages in which I carried out the focus groups. However, as people speak various levels of English, it soon became clear that many people could understand most of my Pijin. Not everyone agreed with the translations the translators provided, and they started providing their own translations when discussing the activity. An additional constraint to having pre-appointed translators was that those with more education and jobs in Gizo town would volunteer, but these were usually also the more powerful people in the villages. For these reasons I stopped using pre-appointed translators, encouraged people to ask for clarification if they did not understand me, and asked the help of participants relatively fluent in English when needed. Commonly people translated and discussed what I had said amongst themselves in their own language. Hence, there was usually a form of translation happening, most of the time from Pijin to the local language.

It is acknowledged that in such process of translation detail and nuances can be lost to some extent. However, the visual nature of a lot of the activities implied that written or spoken language was not always the main means though which data was presented and collected. In the activities where writing was used, this was always done in English. Furthermore, when participants explained what they had done in the activity to me, this was often done in an interactive manner, where people would correct and add to one another. Translation was very rarely a process carried out by one person. Apart from one occasion on the first evening of the focus group in Pailongge, where the men had misinterpreted the explanation of the activity

(which had been translated by the pre-appointed translator), and the women pointed this out to me, to my knowledge there were no large misunderstandings.

During the in-depth interviews I did not have translators. The sensitive nature of topics discussed would not have allowed this (the analysis presented in Chapter 6 and 7 further clarifies this). This did mean that at times I did not understand everything and had to ask for clarification, or that I had to phrase my questions differently. As a result, the interviews sometimes took several hours, but they were usually enjoyable mutual learning experiences. There were a few occasions in which it took me a while to understand what was being said, and there may have been things I did not understand correctly. Nevertheless, considering the topics discussed, I believe this was the best approach.

Finally, it must be noted that although the word 'resilience' is key to this thesis, it was not used in the focus groups or interviews with the villagers. During the workshop in the first field visit it had become clear that resilience was commonly perceived as a difficult term. As explained in Chapter 3, it is a complex term, and it did not feel right to use a word that would likely make people feel uncomfortable due to not being familiar with it. Hence I used and explained the term when asking permission to the village elders or committee to carry out my research, but refrained from using it during the focus group and interviews. I explained the concept in terms of 'preparing for and dealing with disaster', and 'means to react and recover from disaster', along with explanations such as 'I am curious to learn more about what you did when you realised the tsunami was coming, and why did you did this' and 'are there things you do differently now than before the tsunami to prepare for such disasters?'.

4.6 Reflexivity

A researcher's persona influences his or her research data and results (Cloke et al. 2004). My background, identity, interests, and preconceptions have without a doubt influenced my research

data; I influenced my research participants' world and they influenced mine. There is no way around that. However, I do believe I have been able to minimize this influence to a great extent by reflecting and being reflexive; asking a lot of 'why', either to my participants or to myself, greatly contributed to answering the 'how' of my research questions.

Looking back I would predominantly describe my fieldwork as an enriching experience. Immersing myself in the world of the research participants provided me with insights and knowledge that could not have been gained if I had not stayed where they lived. One of the most amazing experiences was joining a Gilbertese family in night-fishing in a dug-out canoe: first peddling through the almost eerie mangrove-forests, followed by the sight of 'phosphorescence' (planktonic forms that emit light when disturbed) in the open ocean. At dawn we pulled in the nets, took the fish out, cleaned and fried them, and sold them at the market. However, trying to take in, see, smell, hear, and learn from dusk till dawn, being surrounded by people 24/7, was sometimes a bit too much, and during the second period of fieldwork I stayed overnight in a guest house one night a week, instead of in the villages. As the researcher, the research field, and the research participants are all involved in a dynamic process whereby each affects the other (Oliver 2004), I feared that the absence of such breaks would have affected my research in a negative way. Yet, these retreats were not only breaks in my process of learning about my participants' lives, they also provided me with the space and time to think in a reflexive way about what I had experienced and observed. This contributed to my learning in other ways. For example, it was at one of these moments that I realised that the fact that, when in the villages, my belongings frequently disappearing was at times less of an act of stealing and more in line with the 'communal model of ownership' (Vallance 2008: 4) and 'long-term borrowing'. From that point onwards, when things disappeared I started asking for them back, and they would often, although not always, be returned to me. In this sense, thinking about how I constructed knowledge, and what this was based on, allowed me to actively re-construct my knowledge and behaviour, a process Finlay (2002: 532) refers to as 'reflexivity'.

In a similar manner, the breaks in between the periods of research provided me with opportunities of reflexivity. Reading more about the Melanesian and Gilbertese cultures when back in the United Kingdom, allowed me to place things I at times did not understand to the fullest extent during the fieldwork in their context. For example, after my first field visit, I read historical documents on the resettlement of the Gilbertese, detailing how the Solomon Islanders perceived this. It provided me with a better understanding of how the relations between the two ethnic groups were shaped, and facilitated my understanding of observed segregations, such as the division in Gilbertese and Melanesian areas on the market in Gizo. It enabled me to work with these differences, and respect them. For instance, I would not ask a Gilbertese person to meet me at the Melanesian end of the market. Hence, reflecting and learning was an important element of this research on the effects of geological events, often studies by the natural sciences, on a setting most often studied by the social sciences.

4.7 Conclusion

This chapter has described and explained the methodology used in this research. It started by detailing how it was informed by two approaches in particular: section 4.1 discussed ethnography and in section 4.2 indigenous and decolonising methodologies were addressed. Section 4.3 explained how both approaches shaped how I carried out fieldwork. Ethnography influenced my approach through its focus on grasping the complex interconnectedness of relations, behaviours and actions, and meaningful structures through obtaining an understanding of the context in which they make sense. Also, its dominant method of participant observation was a method that ran throughout the fieldwork on Ghizo. Through the notions of micro and multi-sited ethnography I was able to draw on this methodological approach without meeting some of its 'traditional' characteristic features. Indigenous and decolonising methodologies shaped my research approach by taking on board its criticism on ethnography and attempting to ensure this was addressed in my fieldwork. Moreover, I based my approach to research on its emphasis on ethics and its strong focus on making the research purposeful for both researcher and research participants. In a

combined manner, these methodological influences shaped my research approach in a way that allowed me to respond to the need for more dialogic and open-ended methods in disaster research, as well as providing the means to addresses my research questions in an adequate way.

Influenced by these approaches I chose a set of methods that were strongly shaped by Chambers' participatory methods: methods that invite participants to share knowledge in their own framework of perception, whilst producing visible and tangible outcomes for both researcher and researched. These methods were carried out as activities in focus groups: one in every research location on Ghizo. Data gathered through these focus groups mainly provided information on collective meanings and experiences. Additionally, the data aided in developing the focus of the individual in-depth, semi structured interviews that were undertaken in the last period of fieldwork. These interviews explored the viewpoints of individual participants, which could not have been generated in focus groups. Besides participatory methods and interviews, participant observation as a method was used, and ran throughout all periods of fieldwork. This method provided me with knowledge of cultural practices which in turn enabled me to show respect and apply culturally-appropriate behaviour. It aided building rapport and relations, and facilitated the research on Ghizo in a general sense.

By using multiple methods I gathered a variety of rich data that a single method would not have been able to produce. The methods therefore compensated one another's strengths and weaknesses, complemented each other and built on each other. This prompts a rethinking of research uncritically carried out according to the guidelines of a more traditional methodological approach, and without further considering the actual context of research; by using a mix of methods one is far more able to choose those methods most relevant to addressing the research questions whilst doing so in a manner applied to the context of research. In relation to the latter, it is worth emphasising the importance of the first visit to the field I carried out a few weeks after having started my PhD: this enabled me to get a good grasp on the context of research before

developing my methods. The empirical data gathered using the methods discussed in this chapter are presented and analysed in the following three chapters.

Chapter 5

Community disaster response

Tri taem nao sea hemi move, hemi kam. Et o'clock hemi happen. Hem shakim tru, then sea him dry. Me sit down lo canoe blo me lo reef. Me go: "Ey what nao happened?" Then wata kam up, so him nao... him takim me go, bringim me lo bis. Wave blo tsunami that wan; first time hemi lillebet. So me kasim bis, me stand up, tellim pipol: "lufella run nao, sea hemi no safe nao. Solwata hemi kam lo vilis." (...) Then second taem hem wettim dry place. Pipol struggle for go across, kasim hill. Pipol run for wanfella Ambolono[36]*, big tree, evriwan. Big tree lo behind village. Time mifella stand up lo Ambolono tree me watchim sea. Last wan nao hemi big wave. Sea hemi busta. Olsem boil lo pot... wait. (...) Me say "Bae me dai noa", bicos strong blo sea...hemi barava new blo mifella evriwan. After mifella kam up lo here, lo Mile 6. Sleep outside, just sleep lo under lo olketa tree - hemi no rain that week. Mifella easy for kasim gaden, kaikai, because mifella makim gaden lo hill.*

Three times the sea moved, the sea came. It happened at eight o'clock [a.m.]. The earth shook hard, and then the sea dried up. I sat down in my canoe, at the reef. I said to myself: "What just happened?" Then the water came back and took me back to the beach. That was the first tsunami wave; it was only small. So I got to the beach, stood up, and told the people "Run away, the sea is not safe. The seawater will come to the village." (...) The second wave reached the dry areas [land]. People struggled to make it to higher ground, so people ran to the Ambolono tree: a large tree behind the village. When I stood up in the

[36]Literature research indicated that the tree mentioned was a Banyan tree (Maka'a 2010). This type of tree can reach heights of up to thirty metres. It has aerial roots that develop from its branches, descend, and take root in the soil to become new trunks (Encyclopædia Britannica Online 2013).

> Ambolono tree I watched the sea. The last wave was the biggest one. The sea busted. It was like it boiled, like in a pot [when boiling water], it was white. (...) I said: "I will die now", because that strength of the sea was new to me, to everyone. After that we came up here, at Mile 6 [on higher ground]. We slept outside, just under the trees - it did not rain that week. For us it was easy to get to the garden and to get food because we already had a garden on higher ground.
>
> Peter, Mile 6 (20 March 2013)

Peter, who was 64-years-old at the time of the tsunami, vividly tells the remarkable story that all people in Saegeraghi are eager to share: how a large tree spared many from being washed away by the tsunami waves. Realising that higher ground was too far away or too hard to get to, Saegeraghi's villagers climbed the large tree (see Figure 25) in large numbers. Houses were destroyed and belongings washed away. However, as a consequence of people's quick initial reactions, partly influenced by the warnings of people like Peter, nobody was injured in Saegeraghi. In the immediate aftermath of the earthquake and tsunami, Saegeraghi's community members were also able to respond well to the disastrous consequences of the hazards.

Figure 25 Villagers from Saegeraghi with their Banyan tree
Source: Maka'a 2010: 3

The response of the Melanesian community of Saegeraghi to the 2007 earthquake and tsunami is explored and analysed in this chapter along with the responses of the Melanesian community of Pailongge and the Gilbertese communities of Niu Manra and Nusa Baruka. As Chapter 3 explained, response is understood to be the first phase of disaster management (the processes of managing the disastrous consequences of hazards), recovery is the second phase. This chapter addresses this first response phase: the four communities' responses to the 2007 earthquake and tsunami, which are also referred to as the communities' ways of limiting and dealing with the immediate disastrous impacts of the hazards. It was also explained that communities' responses encompass two stages: initial reactions upon realising that something was happening, as well as their subsequent coping mechanisms. These two phases are investigated in this chapter (as indicated in grey in the table below).

Table 8 Response: initial reaction and coping mechanisms
This chapter addresses the first phase of disaster management, the communities' response (indicated in grey).

				Section
Sub-question A	*Ch. 5*	RESPONSE	*How communities dealt with disaster*	Stage 1: Initial reactions 5.1 Stage 2: Coping mechanisms 5.2
Sub-question B	*Ch. 6*	RECOVERY	*How communities overcame disaster*	
Sub-question C	*Ch. 7*			

Through investigating the two Melanesian and two Gilbertese communities' responses to the 2007 hazards, this chapter answers sub-question A of the research questions: How did ethnically different communities respond to the same event? As argued in Chapter 3, research on disaster management can provide valuable information on the resilience of communities to the disaster they experienced (Aldrich 2012, Bird et al. 2011). It can also outline crucial details of changes made in the disaster management processes that influence future resilience. Hence, through addressing how the communities responded to disaster, this chapter also contributes to answering the main research question: In the aftermath of the 2007 Solomon Islands earthquake and tsunamis, how have disaster management processes informed community resilience?

It must be reinforced that the term ethnic group is interpreted as the social classification of individuals in terms of their most basic identity (Barth 1969). Ethnic identify is defined from within and cannot be ascribed or achieved (Eriksen 2002). Ethnicity is a contested term, and the use of this term is not intended to reinforce prejudices or racism. Emphasis must also be placed on the fact that it is not ethnicity, or ethnic identity, as a concept that shapes how different groups respond to the same disastrous event; it are the contextual factors, practices and lifestyles associated with the ethnic group that come into play, as this chapter will illustrate. The first part, section 5.1, analyses the communities' initial reactions, identifies the three most important factors shaping differences across the communities' reactions, and discusses how these findings provide information on the four communities' resilience to the 2007 events. Section 5.2, explores and analyses the communities' coping mechanisms through identifying the most important factors influencing the ways they coped, discussing how these factors shaped their coping mechanisms, and finally evaluating how these findings provide knowledge on the communities' resilience to the 2007 events. Section 5.3 presents the conclusion of this chapter, which indicates that contextual variations of ethnic groups inhabiting the same area can lead to differences in their capacities to address with the same event.

5.1 Initial reactions

Ghizo's communities' initial reactions to the 2 April 2007 earthquake and tsunami have been discussed by Ride and Bretherton (2011), McAdoo et al. (2009), Fritz and Kalligeris (2008), and McAdoo et al. (2008). Of these, McAdoo et al.'s (2009) 'Indigenous knowledge and the near field population response during the 2007 Solomon Islands tsunami', provides the most detailed account of communities' reactions to the events.[37] At the time of writing, this was the key resource on these processes. In their evaluation of communities' reactions on Ghizo and neighbouring Simbo Island, McAdoo et al. (2009) ascribe great importance to the role 'indigenous knowledge' played in saving lives. They argue that this knowledge, 'based on generations

[37] What McAdoo et al. (2009) refer to as 'response', is here discussed as 'reaction'.

accustomed to living on an active subduction zone', in combination with local physiography, led Melanesian Solomon Islanders to react in a way that 'reduced their overall mortality' (McAdoo et al. 2009: 74, 78). In contrast, they state, the Gilbertese people did not hold such knowledge, which resulted in a disproportionally high death toll amongst this ethnic group, despite the beneficial physiography (McAdoo et al. 2009: 73).

The fieldwork driving this thesis found similar results; hazard-related knowledge relevant to the local context influenced communities' capacities to react in an appropriate and timely manner. However, the extent to which this knowledge can be considered 'indigenous' is debatable (see sub-section 5.1.1). In addition, as argued in Chapter 3, people's reactions are influenced by a range of factors entangled with the complex daily social, political, geographic, historical, cultural, and economic context of disaster-affected populations. Greater understanding of these contextual complexities and factors of influence can be gained by investigating survivors' behaviours during a disaster (Bird et al. 2011, Ripley 2009), but care must be taken to consider factors of influence as intertwined, rather than isolated (Tierney et al. 2001). Extracting factors from their context, and investigating and presenting them on their own, can overlook some important social dynamics that contributed to the shaping of communities' reactions. This commonly leads to misunderstandings and contributes to the development of an inadequate base of information for policies focussing on building future disaster resilience (Birkmann 2010).

This section presents three interrelated factors of significant importance in shaping the initial reactions of Ghizo's Melanesian and Gilbertese islanders. The factors examined are those most frequently emphasised by research participants during the fieldwork periods, and are partially corroborated by the existing literature on communities' reactions to the 2007 earthquake and tsunami. These three factors, knowledge, physiography, and footpaths, are addressed in the following three sub-sections. Sub-section 5.1.4 evaluates how the Gilbertese and Melanesian communities' initial reactions inform their resilience to the 2007 earthquake and tsunami.

5.1.1 Knowledge of tsunamis and tsunamigenic earthquakes

Taem big shakishaki hemi stop, mifella go lo bis. Lo bis no aniting fall on top lo mifella. Taem mifella stap lo bis, mi lookim big wave hemi kam. Mi ran lo hill, hemi kolsap lo haus, and sing-out lo pikinini lo differen ples lo bis: "Go go, ran!" Bifor me lookim wave animal hemi lookim, him save. Pikipiki hemi jump out lo cage, me no lookim that wan bifor! And him ran. Doggie, kokorako, cat sem sem. Evri animal hem laef. Next taem me lookim animal hemi ran, me ran.

When the earthquake stopped we went to the beach, as nothing would fall on top of us. When we were at the beach we saw the big wave come. We ran to the hill, which is behind our house and shouted to the kids who were in another place on the beach: "Go, run!" Even before we noticed the wave, the animals did, they knew. Pigs jumped out of the cages. I did not see them do that before! They ran. The dogs, chicken and cats did the same. All animals survived. Next time when I see the animals run, I will run.

Tetaake, Niu Manra (NMSS) (1 May 2012)

As mentioned in Chapter 2, Kiribati has experienced tsunamis, but not ones preceded by earthquakes near enough to be felt. Gilbertese Tetaake, originally from Kiribati, did what she thought was most appropriate when the 2007 earthquake rocked her house on Ghizo: to go to the beach so nothing would fall on top of her if the earth would shake again. She did not realise this is inadequate behaviour when living on an island near a subduction zone, where earthquake-generated tsunamis can reach her house within minutes. Tetaake's lack of knowledge on how aspects of the local environment operate, illustrates what McAdoo et al. (2009) describe as the lack of indigenous knowledge responsible for the disproportionally high death-toll amongst the Gilbertese villagers. 'Indigenous knowledge', McAdoo et al. (2009: 75) state, is 'an understanding unique to a given culture or society, emphasizing the relationship between people and their

natural environment, and developed over generations'. McAdoo et al. (2009) argue that the primary factor responsible for reduced mortality rates amongst the Melanesian ethnic group was their indigenous knowledge of how to react to strong earthquakes.

However, fieldwork carried out in Melanesian and Gilbertese villages on Ghizo demonstrated that this is an incomplete argument. The first reason for this is that indigenous knowledge as defined by McAdoo et al. (2009) is a complicated notion in a society that is far from homogenous; knowledge 'indigenous to a given culture' varies amongst the several Melanesian ethnic groups inhabiting the country, and regional differences in hazard-risks create dissimilarities in the development of knowledge based on people's interactions with their environment. Second, life-saving knowledge of tsunamigenic earthquakes did not exclusively originate within the country; external knowledge sources also influenced villagers' reactions. Therefore, rather than using the term 'indigenous knowledge', knowledge aiding adequate reactions to the hazards is here referred to as *locally relevant knowledge*. This knowledge can originate in the Solomon Islands and/or come from external sources. The roles both sources of locally relevant knowledge played in the communities' initial reactions to the 2007 hazards are discussed below.

First, locally relevant knowledge originated within the Solomon Islands influenced Melanesian Solomon Islanders' behaviour to the earthquake and tsunami. Gilbertese Solomon Islanders mentioned the absence of such knowledge, as they are migrants from Kiribati. In data gathered during fieldwork, largely through informal conversations in the villages, fourteen Melanesian Solomon Islanders commented on whether or not they had acquired knowledge of tsunamigenic earthquakes or tsunamis prior to the 2007 events. Where applicable, sources of knowledge they mentioned are listed in Table 9.

Table 9 Melanesian respondents' sources of knowledge of what to do in case of a strong earthquake
The √ stands for having knowledge of tsunamis from the respective sources.

Island of origin of respondent's ancestors	Sex	Ancestral knowledge	Movie[38]
Malaita	F		
Malaita	F		
Ghizo	F		
Vella Lavella/Ghizo	F		√
Vela Lavella	F		
Simbo	F	√	
Simbo	F	√	
Simbo	F	√	
Simbo	F	√	
Simbo	M	√	
Simbo/Vella Lavella	M		√
Simbo/Ghizo	M		√
Makira	M	√	
Makira	F	√	

Out of these fourteen respondents, originating from various islands in the country, two men and five women mentioned they had acquired such knowledge through community or ancestral ties. Five respondents' ancestors (either parents or grandparents) came from the neighbouring Simbo Island, the two other respondents were born in Makira (the country's most eastern province, situated about 530 kilometres from Ghizo). Marie lives in Pailongge, but is from Makira. She explained (19 May 2012):

> *Granddaddy blo me tellim me about big wave. Him tellim that taem big shakishaki hemi kam, iu run lo hill. No stop, no collectim tings, or sapos haus blo iu hemi burn, no try fo offim. Run fas. That wan mifella doim.*
>
> My grandfather told me about the big wave. He said that when a big earthquake comes, you run uphill. Don't stop to collect things from the house, or if the

[38] This was a commercial video on a tsunami. Respondents thought it was the 2004 Indian Ocean tsunami. The title of this video or movie could not be retrieved.

house is on fire, don't try to extinguish it. Run as soon as you can. That is what we did.

The people from Makira had heard about earthquake-generated tsunamis from a shared grandparent, but did not know on what exact event the knowledge was based. The five people whose ancestors came from Simbo referred to an earthquake and small tsunami in the late 1950s. This is likely the 7.2 magnitude earthquake of 17 August 1959, referred to by Fritz and Kalligeris (2008). The source of the earthquake was just off the coast of Ranongga Island. The earthquake was followed by a small tsunami observed from Simbo and Ranongga (Soloviev et al. 1997), located about thirty and eighteen kilometres in distance from Ghizo, respectively. Knowledge about the tsunami was spread across these islands (Fritz and Kalligeris 2008). No records indicate the tsunami was observed from Ghizo, and despite the close proximity of the events, knowledge of this event was not widely spread on Ghizo among Melanesian and Gilbertese populations. It appears that a key factor to passing on knowledge was whether hazards were directly observed: knowledge of the 1959 events was spread locally where the events were observed, and only reached Ghizo through in-country migration of people from Simbo. This relates to the concept of disaster subculture introduced in Chapter 3; the knowledge originated on Simbo and in Makira is life-saving knowledge generated and passed on by the population of an area that previously experienced (potentially) disastrous hazards, not by populations who have not experienced the events. The notion of disaster subculture is discussed in more detail in section 5.2.

These findings indicate that the 'indigenous and localised life-saving knowledge' discussed by McAdoo et al. (2009) was not indigenous to the Solomon Islands as a whole, and in most cases not indigenous to Ghizo. It illustrates the point made by Mohan and Yanacopulos (2007), namely that there is a danger of promoting local knowledge, whilst dismissing non-local knowledge. It strengthens the rationale for using 'locally relevant knowledge' rather than 'indigenous knowledge'. 'Indigenous knowledge' is not necessarily an unsuitable term, but the context to

which the knowledge is indigenous needs to be defined in detail. At times academic literature refrains from doing so (e.g. McAdoo et al. 2008), which can cause differences in understanding with regard to whose knowledge it concerns, and in what context. If the context of 'indigenous' knowledge present on Ghizo would have been defined as geological, it could be stated that Makira, Simbo and Ghizo are part of the same context and that locally relevant knowledge was therefore indigenous to this context. However, if the context was defined as cultural or geographical, it could be argued that these islands belong to different contexts, and that knowledge was transferred between contexts. This would present a critique of the frequently stated argument that indigenous knowledge is most applicable to its context of origination, and not transferable to other contexts (Kelman et al. 2012, Briggs 2005), at least not without re-contextualisation (Dekens 2007). The point here is not to present an opinion on whether knowledge can be re-contextualised or not, but to illustrate that, when using the term, the context of indigenous knowledge needs to be carefully defined.

Regardless of how the knowledge used by Melanesian survivors is defined and whether it was therefore indigenous to Ghizo or not, the knowledge was locally relevant. Influencing the disproportionately high death toll amongst the Gilbertese was not only the fact they did not hold locally relevant knowledge, as they are originally from Kiribati, but the fact that several Melanesian Solomon Islanders with locally relevant ancestral knowledge resided on Ghizo, especially in or around the Melanesian villages of Pailongge and Saegeraghi. Although this knowledge was not shared extensively before the 2007 events, it was rapidly spread when changes in the sea were observed immediately after the 2007 earthquake. Hence mainly Melanesian Solomon Islanders benefited from this knowledge.

Second, locally relevant knowledge originating beyond the Solomon Islands influenced initial reactions to the 2007 events. This knowledge, based on the Indian Ocean tsunami, was transferred from a local to a global level through media, and became of relevance in another local

context. It testifies to the mobility of knowledge in a globalised world. Two main sources of externally generated locally relevant knowledge were identified. First, as the third column in Table 9 indicates, several Melanesian people said they gained knowledge of tsunamis by having watched a commercial video on a tsunami a few weeks before the 2007 tsunami hit. In Ghizo's villages, movie nights are often organised by a person with a DVD-player and generator, who charges a small fee for people to attend. The video on the tsunami was played in the Melanesian village of Bimbolo (close to Pailongge), and in Gizo town.[39] Three people claimed the movie influenced their reactions to the unusual movements of the sea after the earthquake: they ran to higher ground when the sea withdrew and shouted to others to do the same. In other informal conversations with Melanesian Solomon Islanders the movie was also mentioned. The people who referred to the movie said they did not know such events could occur in their region; they did not watch the movie to gain information on tsunamis, but purely for leisure. However, as movie nights are very popular on Ghizo, they are suitable means of information transmission. A second source of locally relevant knowledge originating beyond the country was mentioned in various informal conversations with people in and around Pailongge; this was the presence of two English surfers staying in the Melanesian village of Suvania (close to Pailongge) at the time of the tsunami. One of them, William, returns to the place on a yearly basis. William detailed (26 May 2012):

> When the earthquake occurred I jumped out of window of the house we were staying at. Thinking of the 2004 tsunami I thought it'd be wise to have a look at the sea. I saw the water channelling out of the reef. Never in the one month that we'd been there had I seen this happen. I started to run, and shouted at others to run to higher ground. People started to run and scream. At that time you couldn't understand each other anymore. We could be as close as you and I

[39]As the movie came up as a source of knowledge when asking Melanesian people about ancestral knowledge, Gilbertese people from Nusa Baruka and Niu Manra were thereafter asked if they had seen this film or another film on tsunamis. The answers indicated they had not.

are now, but we wouldn't be able to hear each other. The people shouting and screaming, the sound of the wave coming in...

This sub-section has shown that ancestral knowledge was largely not indigenous to Ghizo, and that it was just one part of the amalgamation of locally relevant knowledge derived from different sources and temporal and spatial scales. Whereas the in-country knowledge dated back several decades and was transmitted orally, the knowledge of the Indian Ocean tsunami was based on a relatively recent event. The latter was distributed to a global level by the media, and was spread in a direct manner on Ghizo through a movie, and in an indirect manner through a person who had seen news-items on the Indian Ocean tsunami. This points to the connections in our increasingly globalised world, through which knowledge generated in certain places impacts people in other places (Barnett and Land 2007). This also illustrates that non-scientific knowledge can be global in nature and locally relevant in other parts of the world, whereas hazard and disaster literature is often preoccupied with scientific knowledge when discussing knowledge that is global in nature (e.g. Kelman et al 2012, Mercer et al. 2010) or subject of redistribution (e.g. Whatmore 2009). In addition to critical geographers' frequent attention to the negative aspects of these global connections in a disaster context (Clark 2007), these findings illustrate that global connections have the potential to impact positively on people in other places. All knowledge contributed to increased hazard-related protective behaviour amongst those who held the knowledge and amongst those who benefitted from the rapid transfer of this knowledge when the hazards hit, supporting the range of literature on the relations between knowledge and power (e.g. Gunaratnam 2003, Foucault 1977). These findings lead to conclusions similar to those presented in Bird and Dominey-Howes' (2006) study on public awareness of tsunami hazard and risks, which states that knowledge gained through the media increased protective behaviour but did not increase tsunami-risk awareness as no further knowledge was gained on how tsunamis are commonly generated and in which parts of the world.

All knowledge discussed was present in Melanesian villages, influencing initial reactions of Melanesian Solomon Islanders. The sources of knowledge mentioned in the Melanesian villages were all absent in the Gilbertese villages, as were other sources of locally relevant, lifesaving knowledge of tsunamis. In addition to locally relevant knowledge, the physiography of Ghizo played a prominent role in shaping initial reactions.

5.1.2 Physiography

> *Taem tsunami kam me stap lo Titiana. Mi laki, mifella stap lo teacher residence, hem kolsap lo high ground. So hem easy fo run, and mifella stap safe lo bush.*
>
> When the tsunami came I stayed in Titiana. I was lucky, we stayed at the teachers' residence, which is close to higher ground. So it was easy to run [to higher ground], and we stayed safely in the bush.
>
> Kbareti, Niu Manra Site Sea (31 May 2012)

A second factor shaping Ghizo's islanders' reactions was the local physiography. McAdoo et al. (2009) claim there were no large differences between the physiography of the affected Melanesian and Gilbertese villages. They pay particular attention to the Gilbertese village of Titiana (located between Niu Manra and Pailongge), which had the highest number of casualties of all affected villages, and the neighbouring Melanesian village of Pailongge, where there were no casualties.[40] Pailongge and Titiana were both characterised by having a flat plain backed by hills (see Figure 26). According to McAdoo et al. (2009) these similarities in physiography show that the differences in casualties between Pailongge and Titiana were therefore related to 'indigenous knowledge'. However, the flat plain in Pailongge predominantly comprised the area between the seashore and the village, and the flat plain in Titiana mainly comprised the area

[40] Titiana is the only village cited in existing literature in relation to the role of local physiography in exacerbating tsunami impacts. Although Titiana was not one of the villages used for fieldwork, it is discussed here for comparative purposes before moving on to a discussion of the villages central to this research.

between the village and the hills (with the exception of the school and the teachers' residence which were situated close to higher ground); as explained in Chapter 2 the Gilbertese people mainly lived along the shoreline to facilitate the ocean-based livelihood activities they traditionally rely on. This implied that the distance between higher ground and people's homes was much smaller in Pailongge than it was in Titiana, which had negative consequences for the inhabitants of Titiana. In focus groups carried out in all four communities, the distance to higher ground was amongst the foremost reasons mentioned when referring to the high number of casualties amongst the Gilbertese villagers, especially in Titiana (see Table 10).

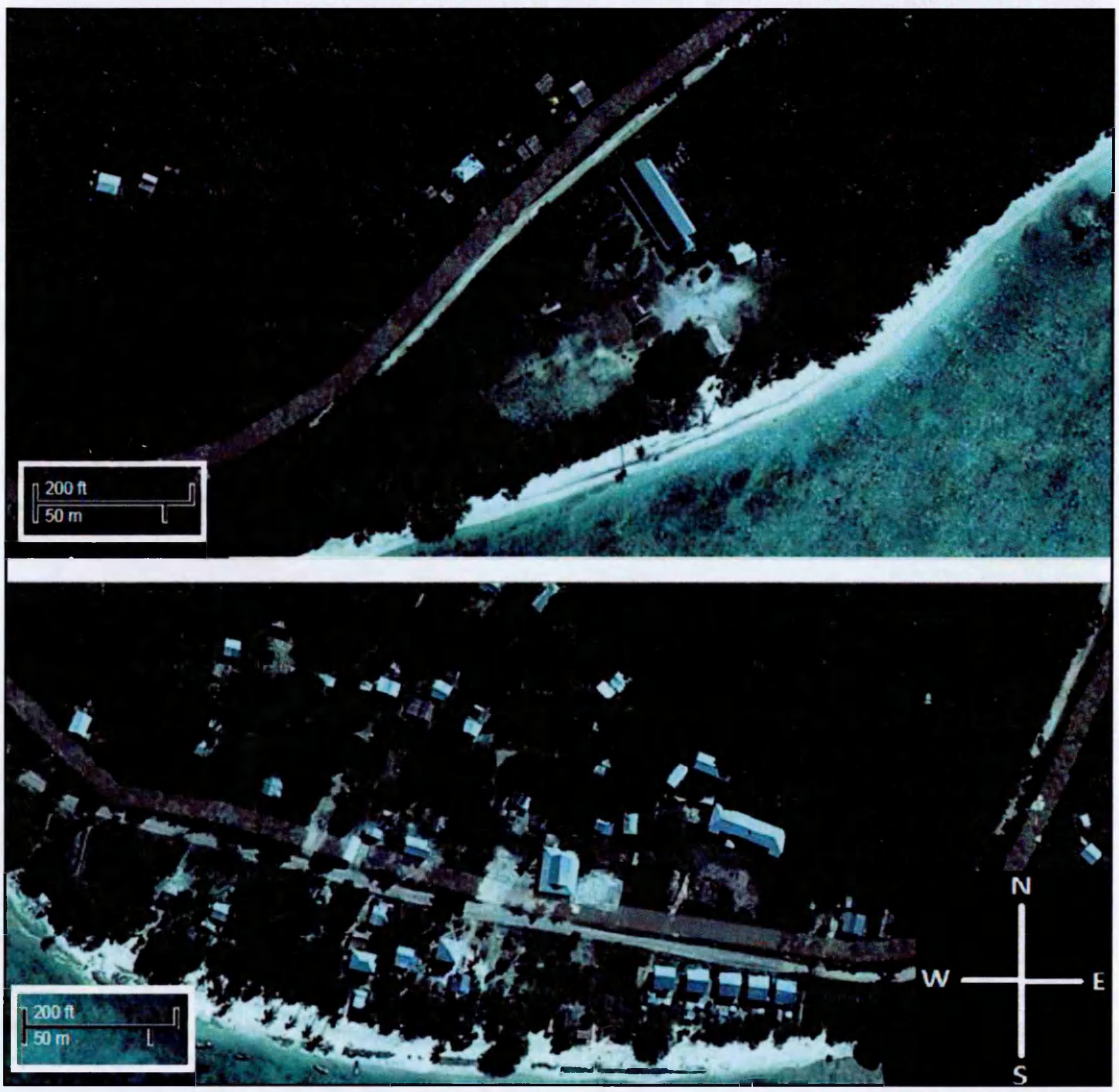


Figure 26 Aerial pictures of Pailongge (top) and Titiana (bottom)
These pictures show Pailongge and Titiana in early 2013. Prior to the tsunami most houses in Pailongge were situated near the road. The area between the shoreline and the road is flat, as is the first part of the area on the other side of the road. Behind that, higher ground starts. In Titiana most houses were located south of the road, near the coastline. Higher ground starts behind the school (the long rectangular building located about 1/3 from the right hand side of the bottom picture). The teachers' residence Kbareti spoke off was located behind the school, even closer to the hills. Source: Google Maps 2013.

Table 10 Reasons mentioned in the focus groups (FG) for the disproportionately high number of casualties amongst Gilbertese villagers (Titiana in particular)

	FG Saegeraghi	FG Pailongge	FG Niu Manra	FG Nusa Baruka
Distance to high ground is far/hard to get to	•	•	•	•
Lack of knowledge			•	•
People explored the beach	•			
Population is higher			•	

Like Pailongge, the pre-tsunami location of Niu Manra was close to higher ground and backed by steep hills. Peia, one of Niu Manra's elders, highlighted the importance of this (8 June 2012):

> The first two waves killed the people. We looked at the sea when the tsunami came because we had never seen such a thing. Then we saw the water stand up; only then we started to run. We are very close to the hill, so we were all safe. Nobody in my family died. By the time the third wave came all [remaining] people were safe. It was the third wave that destroyed the houses, the first and second wave didn't. Only three houses in Niu Manra remained standing.

Compared to Pailongge and Niu Manra, the higher ground in Saegeraghi was harder to reach. As indicated in the opening quote of this chapter, a large Banyan tree was the highest point that could relatively easily be reached in a short time span. Gabriel from Seri, a small village neighbouring Saegeraghi, explained (11 May 2012):

> Do you see that tree? The whole village was up there, including a woman with a three-day-old baby. We laugh about it; women wear skirts and should never climb up in something when a man is standing below, but in this case we ignored the rule.

Higher ground was also difficult to reach in Nusa Baruka. At the time the tsunami hit, the majority of the houses were built at the seaside, on the coral reef (see Figure 27). The houses were built on stilts in the water and people traversed between them by canoe (see Figure 28). This impeded a quick escape; as the village was partly built in the sea and in between mangroves, people struggled to reach higher ground.

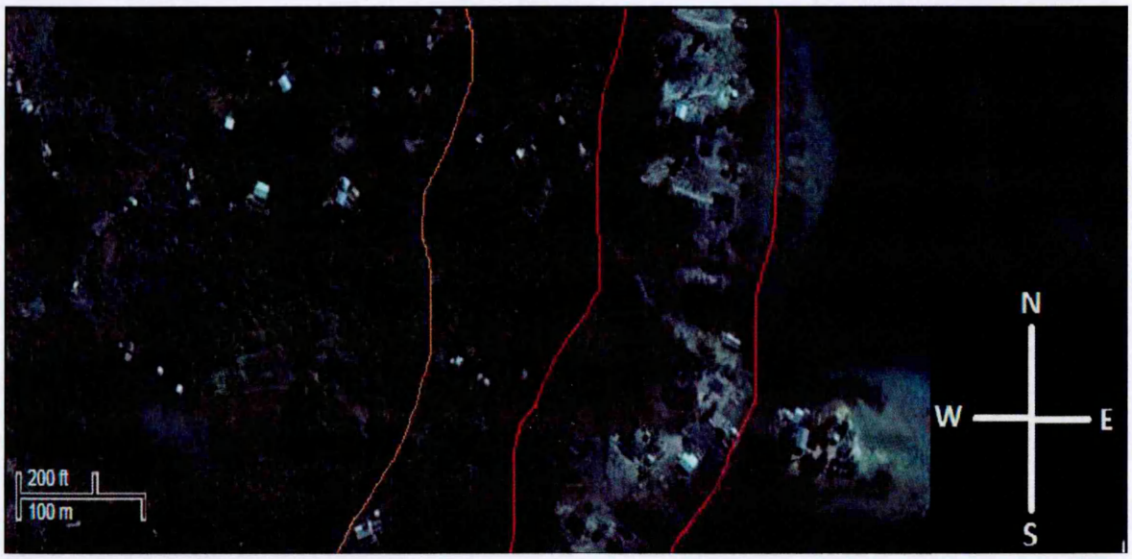


Figure 27 Aerial picture of Nusa Baruka
This picture shows Nusa Baruka in early 2013. The area between the two red lines is the area where most houses were located prior to the tsunami. This was, and is, mainly coral reef: a flat area. Observations from the field estimate that the area between the orange line and the leftmost red line is relatively flat land as well.
Source: Google Maps 2013

Figure 28 Sea, mangroves, and canoes in Nusa Baruka
This picture is taken in 2012 at the original location of the original village of Nusa Baruka. This part of the current village is partially located on the coral reef and in between mangroves. Canoes are used to move around if houses cannot be reached by foot. In 2007 this was what most of the village looked like.

Both Nusa Baruka and Niu Manra had a stand of mangroves in front of, or in, the village. Mangrove stands can offer a protective defence against incoming tsunami waves (Kathiresan et al. 2005, McAdoo et al. 2009). It is not known whether the mangroves in Nusa Baruka played a protective role, but in Niu Manra the tsunami energy was strong enough to overwhelm this potential buffer (McAdoo et al. 2009). Hence Niu Manra's affected villagers have no positive opinion on the protective function of mangroves. In addition, in both Gilbertese villages several people described how they or their children got stuck in the mangroves as they were being swept away by the tsunami waves. Madelyn from Nusa Baruka detailed (16 March 2013):

> *(...) so mifella struggle, go go, me go pas lo mangrove, ota mangrove lo site sea. Mi go pas lo there, me stuck lo there. So wanfella woman, me lookim him, cry no moa: "Helpim me, helpim me!" Tufella pikini blo him stuck lo house lo mangrove, tufella pikinini blo him smol osam. So mifella struggle noa for takim pikinini. Then wanfella minister, noa him helpim him.*

> (...) so I struggled [to swim], I passed the mangroves, those mangroves at the seaside. I passed the mangroves and got stuck there. I saw one woman, she was crying: 'Help me, help me!' Her two children were stuck in the house in the mangroves, both small children. So we struggled to take the children out. A minister [from the church] eventually got the children out.

Madelyn's story shows that aspects of the physiography usually regarded as a first line of defence against tsunamis can also obstruct the escape to safety. Mangroves are an example of this, just as the enabling and disabling aspects of flat plains were. Not mentioned by research participants, but recorded by McAdoo et al. (2009) are the coral reefs in front of Niu Manra and Pailongge that attenuated some of the tsunami's energy. Yet, McAdoo et al. (2009) also argue that channels in the reef focussed wave energy onshore, increasing Niu Manra's and Pailongge's exposure to the tsunami waves. Hence certain aspects of the physiography can play double roles. As demonstrated, physiography can also aid in unexpected ways: to their own surprise Saegeraghi's villagers realised that the largest tree in their village provided the quickest escape to the oncoming waves. Saegeraghi's tree played an important positive role in getting to safety in time, just as Pailongge's and Niu Manra's proximity to higher ground did. The following sub-section discusses the role man-made adjustments to the local physiography played.

5.1.3 Footpaths

> There were paths [uphill] before the tsunami, but we never know [knew] about evacuation sites. But when that event occurs [occurred] we found our paths and run [ran] up, and it seems that those were the evacuation routes for us. There were more than ten [paths].
>
> Anne, Pailongge (15 May 2012)

Routes for evacuation were used on a daily basis by Melanesian Solomon Islanders to access their gardens. As mentioned in Chapter 2 and further discussed in Chapter 5, gardening and selling produce from gardens is one of their main livelihood strategies. The majority of their gardens were situated in the inland hills of the island, where the soil is fertile and shade is provided by large tree species. Pailongge's participatory mapping activity indicated that the gardens and 'viewpoints' on higher ground were untouched by the tsunami waves, whereas most of the village itself was inundated by the tsunami. The right-hand image in Figure 29 illustrates this: the airbrushing on the redrawn map represents the tsunami run-up, which was indicated on the original map (partly shown in the left-hand image) by scattering sand on it after the picture was taken. By discussing the tsunami run-up on Pailongge's map participants explained that the footpaths connecting the villages to the higher ground were used to evacuate quickly when the tsunami waves approached. These paths were not designed as evacuation paths; they were not separate rescue systems, but were part of every-day life.

Figure 29 Close-up of the map created in Pailongge's focus group, showing footpaths leading uphill
The left image shows part of the original pre-tsunami map created by Pailongge's focus group participants, the right image is a redrawn map based on the left image, after the tsunami run-up was indicated by scattering sand on the map. The shells on the left image indicate villages part of the municipality of Pailongge; the brown twigs are footpaths leading to the gardens.
Source: Focus group Pailongge, 15 May 2012

Unlike the Melanesian Solomon Islanders, the Gilbertese people traditionally do not practice gardening on a large scale. At the time of the tsunami, the Gilbertese population's livelihood activities were predominantly fishing and harvesting seafood. Some people in Niu Manra did have '*babai*'[41] (swamp taro) gardens in the area behind their houses, not on higher ground. The absence of paths that could be used for evacuation is a major difference between the pre-tsunami map of Pailongge and those made in Niu Manra and Nusa Baruka. In Niu Manra it was stated that prior to the tsunami there were no paths leading uphill from their village. In Nusa Baruka there was one path leading inland (see Figure 30).

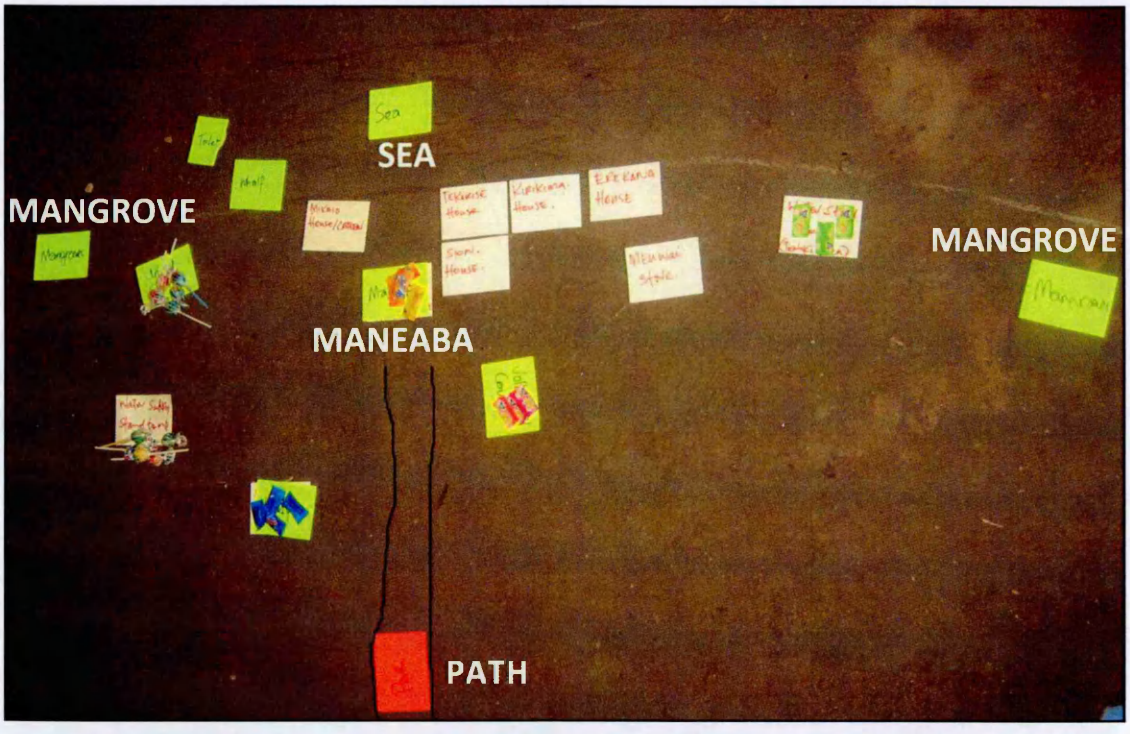


Figure 30 Close-up of Nusa Baruka's participatory map, showing the footpath leading inland
This pre-tsunami map indicates the position of the only path leading uphill in Nusa Baruka. Note that this map also indicates the mangroves, referred to in the previous sub-section. For clarification purposes the path is emphasised with a black line and the words on cards referred to in this chapter are typed out.
Source: Focus group Nusa Baruka, 4 May 2012

This is still one of the few paths that existed at the time of research. It is a narrow path made of coral pieces, and floods during high tide or heavy rain. Similar to the other footpaths in Nusa

[41] *Babai* is the Kiribati name for Giant Swamp Taro (*Cyrtosperma merkusii*). The crop is known as *kakake* in the Solomon Islands. There are several varieties of the crop which is grown throughout Oceania. Swamp taro is important for food security as the large tubers can stay in the ground for a long period of time and be harvested when needed (Kastom Garden Association 2010).

Baruka (see Figure 31) it allows only a small number of people to make their way to higher ground simultaneously. Both in Nusa Baruka's and Niu Manra's focus groups this was mentioned as a factor impeding safe escape.

Figure 31 Footpath made of tree trunks in Nusa Baruka
At high tide this swampy area where mangroves grow is flooded, making the footpath less accessible.

Gaillard et al. (2009) argue that people's capacities to face coastal hazards cannot be disassociated from their livelihood sustainability. By discussing rapid-onset storm surges in the Philippines, they state that people's exposure to natural hazards, their fragility in the face of such hazards, and their capacity to cope with disaster are linked to the diversity, strength and sustainability of their livelihoods. Fieldwork on Ghizo demonstrated that the types of livelihood people rely on also influence their capacity to *react* appropriately to rapid-onset hazards with warning-times of only minutes; footpaths associated with gardening were used as evacuation routes. Although the paths were never designed for this purpose, they did strengthen the Melanesian villagers' capacities to deal with disaster, therefore contributing to a greater resilience in comparison to their Gilbertese neighbours who had fewer and less accessible paths.

5.1.4 Initial reactions and resilience to the 2007 hazards

As discussed in Chapter 3 and briefly mentioned earlier in this chapter, a community's resilience refers to their capacity to deal with and overcome disaster. How a community dealt with disaster can be researched by looking at their responses, which comprises immediate, initial reactions as well as their coping mechanisms. As communities' initial reactions are crucial for saving lives (UNISDR 2007: iii), differences in communities' capacities to react can constitute differences in their survival rate. The data presented above illustrates substantial differences in the reactions of Ghizo's Gilbertese and Melanesian ethnic groups to the 2007 earthquake and tsunami. These differences were shaped by locally relevant knowledge of tsunamis and tsunamigenic earthquakes from sources internal and external to the country, features of the local physiography, and the presence or absence of footpaths used as evacuation routes. The use of knowledge of tsunamis and tsunamigenic earthquakes confirms the relevance of this as one of the characteristics of a resilient society as mentioned in Table 5 in Chapter 3: 'bringing different kinds of knowledge together'. Footpaths used as evacuation routes relate to the mention of 'emergency infrastructure' in the same table; although not built for the purpose, the presence of paths and their use in everyday situations meant that they could be used as emergency-infrastructure.

Building on Gaillard et al.'s (2008) and Paton et al.'s (2006) argument that differences in the availability of and access to resources influence the capacity to cope with disaster, it is argued here that these same differences also influence the capacity to react. Knowledge, physiography, and footpaths can all be seen as resources - resources to which the Gilbertese had less access, influencing their capacity to react in a negative way in comparison with their Melanesian neighbours (see Table 11). The differences in access to resources can largely be ascribed to differences in the socio-cultural and geographical context of the Melanesian and Gilbertese ethnic groups; it is not inherent to ethnicity as such. Hence, when viewing the four communities' reactions as part of their responses, and viewing their capacity to respond as indicative of their resilience, it is here argued that variations in their initial reactions contributed to variations in the

ethnic groups' resilience to the 2007 earthquake and tsunami. The next section analyses how mechanisms of coping with the immediate aftermath of the earthquake and tsunami inform the communities' resilience to the 2007 earthquake and tsunami.

Table 11 Capacity to react: differences in ethnic groups

Phase of disaster management				***Findings***
Phase 1	RESPONSE	*How communities dealt with disaster*	Stage 1 Initial reaction	Melanesian ethnic group's capacity to react > Gilbertese ethnic group's capacity to react
			Stage 2 Coping mechanisms	

5.2 Coping mechanisms

Developing Telford and Cosgrave's (2007) argument that 'affected people are not homogenous entities', section 5.1 of this chapter illustrated that the ways in which people react to natural hazards are also not homogenous. The section explained that important differences in the reactions to the 2007 earthquake and tsunami could be seen between the Melanesian and Gilbertese ethnic groups. This pattern was reproduced in the days that followed. After the tsunami waves hit Ghizo most survivors sought refuge on higher ground, afraid to return to the locations of their former villages at the coast. On higher ground they waited for disaster aid to arrive. The isolated location of Ghizo meant that it took up to four days for aid to reach the area. In the first days affected villagers had to rely on their strategies of survival to deal with the immediate disastrous impacts of the tsunami. As discussed in Chapter 3, such strategies are here referred to as coping mechanisms, and are seen as the second stage of the disaster response phase. Two factors, disaster subculture and livelihoods, played a prominent role in shaping variations in the ethnic groups' coping mechanisms and are discussed in sub-section 5.2.1 and 5.2.2. How exactly these two factors combined to shape the Melanesian Solomon Islanders' coping mechanisms is discussed in 5.2.3, followed by how they shaped the Gilbertese Solomon Islanders' coping mechanisms in 5.2.4. These sub-sections are each split up into smaller parts to

structure the information presented. Similar to sub-section 5.1.4, sub-section 5.2.5 analyses and discusses how the Gilbertese and Melanesian communities' coping mechanisms informed their resilience to the 2007 earthquake and tsunami.

5.2.1 Disaster subculture

> *Shortage of wata hemi kausim gaden fo crops hemi less, so change mifella makim: mifella depend on long-term crop, for example kakake. (...) So what mifella do is plant more cassava, bananas, and kakake in order to make yourself less vulnerable during those hazards.*
>
> The shortage of water [during the 1997 El Niño] affected our crops, so a change we made is that we started to depend more on long-term crops, such as *kakake*. (...) So we started to plant more cassava, bananas and *kakake* to reduce our vulnerability to such hazards.
>
> Anne, Pailongge (14 May 2012)

As described in Chapter 3, a disaster subculture refers to patterns operative in a specific area, geared towards the solution of problems arising either from the awareness of disaster threat or from having experienced disasters (Anderson 1965). This knowledge is mainly passed on orally from generation to generation, is embedded in historical and geographical contexts, and is expressed in cultural facets such as legends, knowledge and practices (Mercer et al. 2012, Gaillard et al. 2008, Wenger and Weller 1973, Anderson 1965). A community's disaster subculture serves as a blueprint for behaviour before, during, and after a hazard occurs (Anderson 1965). Although disaster subcultures are the product of generation-long learning from previous hazards (Anderson 1965), one event of particular significance warrants more elaboration in the examination of the coping mechanisms of the affected people.

In 1997 an El Niño episode caused serious drought throughout the Solomon Islands. Sources of safe drinking water diminished rapidly and crop yields were low (Barr 1998). In the Melanesian communities, El Niño was a prominent entry in the historical timelines (see Chapter 4 for a description of this method). As the Melanesian Solomon Islanders relied heavily on gardening, their sources of food were drastically affected by the drought. In Pailongge's focus group it was indicated that several adjustments to lives and livelihoods were made during this time (see Table 12). This focus group was notable as the teenage girls present formed their own group (see Figure 32), calling themselves the 'Lady Gagas', rather than joining the other women. Without discussing with the (older) men and women, the girls mentioned the increased reliance on cassava, swamp taro, and bananas as adjustments made in response to the drought (see Table 12). Most of the girls were not yet born in 1997 or were too young to remember that these changes occurred at that time. They stated that their parents provided them with this knowledge, confirming Anderson's (1965) argument that the knowledge component of a disaster-subculture is passed on from generation to generation.

Table 12 Changes made in Pailongge that were geared towards dealing with El Niño and towards preparing for future disaster caused by hazards of a similar nature

Changes made geared towards overcoming El Niño
- Pick coconuts and drink coconut water - Dig wells - Rely on bush (wild) foods such as wild cabbage (e.g. *Gupe, Ohenga, Ande*, and *Fen*) and wild taro - Rely on long-term food such as swamp taro
Changes made to enhance preparedness for future disaster, based on dealing with El Niño
- Awareness programs from church, to educate people - Encourage families to make rainwater tanks - Encourage people to plant crops that last long - Plant cassava, *kakake* and bananas - Baking instead of cooking (*kastom* cooking: *motu* cooking and *bo-ne bo-ne* cooking) - Smoking fish without water - Use salt water to wash food, and only sweet water to rinse it - Share with other people - Pick up twigs to make fire (rather than firewood) - Traditional ways of making things: local materials for making homes - Pass on knowledge to next generation

Figure 32 Historical timeline Pailongge
The teenage girls, a.k.a. the Lady Gagas, listen to the translation of their historical timeline.

Historical timelines created in the Gilbertese communities did not list this drought. Focus group participants acknowledged that it happened but said it affected them less than the Melanesian Solomon Islanders because they traditionally rely more on ocean-based sources of food, and less on gardens. 'We dry fish and plant *babai* (swamp taro). Therefore we were not vulnerable to hazards, at least not to hazards we knew about', stated a participant of Niu Manra's focus group. In both Gilbertese communities El Niño was therefore not seen as a disaster; inhabitants said they were not significantly affected and did not need to adapt their lives and livelihoods during the drought. They knew of the knowledge and practices their Melanesian neighbours used to deal with El Niño, but did not hold the practical and exact 'know-how' of these practices as the knowledge was not acknowledged as important to them.

Wenger (1978) lists three factors that determine the development of a disaster subculture: A) the repetitive impact, B) the time gap between signs of the disaster and the impact of the disaster,

and C) the level of damage or impact. The third factor has been of critical importance for the reinforcement of a disaster subculture in the Melanesian communities in 1997, and the lack thereof in the Gilbertese communities. Practices and patterns re-emphasised by Melanesian Solomon Islanders were embedded in the cultural context and were already carried out prior to El Niño. However, as these practices were re-emphasised during the drought, they can be considered as part of a disaster subculture. The Gilbertese Solomon Islanders were not affected as much and thought they were prepared for disaster by drying fish and having swamp taro: practices that traditionally helped them to cope with disaster (mainly related to droughts and floods) in Kiribati (MacDonald 2001). What this illustrates is that it is as important to understand people's perception of hazards as it is to understand the actual impact of the event (Schwarz et al. 2011). Personal experiences of hazards influence personal interpretations of and attitudes towards hazards, and influence the knowledge used in living with hazards (Copp 2004, Seyfang et al. 2010, Schatzki et al. 2001, Beck 1992). Hence, as sub-sections 5.2.3 and 5.2.4 below will demonstrate, differences in such experiences influence knowledge and practices used for coping in different ways.

5.2.2 Livelihoods

> *Evriwan save makim gaden. Grannies blo mifella hemi teachim mifella. Time blo olketa no garem seleni. Haus, gaden and fisin hemi important tumas. Sapos iu no save fo makim gaden, iu pua man.*
>
> Everyone knows how to make a garden. Our forefathers taught us how to do gardening. At that time there was no money. The house [constructing a house], garden, and fishing are priorities. If you do not know how to do gardening, you will be a poor man.
>
> Focus group Pailongge (19 May 2012)

Livelihoods play an important role in the capacity to cope with disaster. Diversification of livelihoods is important for reducing the risk of a hazard turning into a disaster or a disaster escalating even further; if a livelihood consists of only one activity and that activity becomes inaccessible, means of coping become increasingly difficult. Fortunately livelihoods, particularly in developing countries, rarely rely upon one single activity (Gaillard et al. 2009). The diversification of livelihoods, as well as the strength of the diversification, influences the capacity to cope with disaster (Gaillard et al. 2009, Twigg 2004, Pelling 2003); if a community depends on a variety of livelihood activities, but all these activities are at risk of being made inaccessible by the occurrence of a hazard, diversification alone does not provide better means to cope. The strength of livelihoods can be seen in the presence of livelihoods outside vulnerable areas (Gaillard et al. 2009) or their transferability to other locations (Kelman and Mather 2008). The nature of a hazard also plays a role in how livelihoods influence coping mechanisms. During disasters caused by slow-onset hazards, like the 1997 drought, it is easier for affected people to gradually alter their livelihood activities, whereas rapid-onset hazards allow fewer opportunities for doing so. During rapid-onset hazards livelihood activities facilitating directly-accessible strategies of survival are of extreme importance.

The Melanesian communities mentioned gardening, fishing, producing copra, constructing houses, animal husbandry, labour in town, having shops at home, diving shells for export, handicrafts, baking cakes, and making canoes, peddles, and handicrafts as their livelihood activities prior to the tsunami. Gardening was a substantial part of their livelihood, and was practiced consistently by all families in Pailongge and Saegeraghi. Gardening was largely absent in Gilbertese villages and gardens on higher ground displaying the variety of products seen in Melanesian gardens were lacking, with the exception of gardens made by a few mixed Gilbertese-Melanesian families in Niu Manra. The Gilbertese communities indicated a large reliance on fishing and harvesting seafood, supplemented by copra, animal husbandry (mainly pigs), handicrafts, labour in town, having shops at home, baking cakes, and producing coconut oil.

The following sub-sections illustrate how the information presented in this and the above sub-section shaped the coping mechanisms of the Melanesian and Gilbertese Solomon Islanders.

5.2.3 Melanesian Solomon Islanders' coping mechanisms

Me kaikaim kaikai lo gaden, bicos gaden blo mifella lo on top. Tsunami hemi no kasim gaden, so mifella usim kaikai lo gaden. Pot blo mifella hemi wash away but mifella usim pot blo olketa lo Mile 6, ota men waka lo agriculture. So mifella stay wetem olketa lo Mile 6. So olketa helpim mifella, ota givim mifella pot, plate, spoon, anything lo olketa noa mi usim. Lo hea no aniting, evriting blo mifella hemi barava wash away. (...) Mifella kaikaim potato, cassava, kebis, and sometime mifella usim bush-kebis, so hem gud.

[The first few days after the tsunami] I ate food from the garden, because our garden was on higher ground. The tsunami did not reach the garden, so we used the food from our garden. Our pot [for cooking] was washed away but we used a pot from the people at Mile 6, the people who work at agriculture [station of the ministry of agriculture]. We stayed with them at Mile 6, and they helped us; they gave us pots, plates, spoons, everything they had we used. Here nothing was left, everything that was ours was washed away. (...) We ate potato, cassava, cabbages, and sometimes we used wild cabbages, so it was good.

Charles, Saegeraghi (20 March 2013)

As Charles points out, the ways Melanesian survivors coped were heavily characterised by a reliance on produce from gardens and the forest. Although survival was to a certain extent aided by the people at the agricultural station's emergent and self-organised response efforts, produce from gardens and the forest was frequently prepared through traditional means of cooking. Below the impact of gardens, wild foods, and traditional cooking on the coping mechanisms of

Melanesian Solomon Islanders will be discussed, whilst referring to the specific roles played by disaster subculture and livelihoods.

5.2.3.1 Gardens

As explained in section 5.2.2 gardening was a foremost livelihood activity amongst Melanesian Solomon Islanders. Most families had small gardens near their houses and larger gardens uphill. Particularly the latter were home to a large variety or crops. Participatory observation in combination with a lady from Bimbolo (near Pailongge) showing me her garden, and explaining what crops she had, led to the identification of at least 26 different crops part of the Melanesian Solomon Islanders' diets. For instance, banana, coconut, guava, *kapika* (*Syzygium malaccense* or Malay apple), orange, pawpaw, pomelo, rambutan, five corner (*Averrhoa carambola*) and *potera* (part of the *Passifloraceae* family) trees are commonly farmed along with root-crops such as cassava, English potato, *kumara* (sweet potato), pana, yam, Solomon yam, swamp taro and regular taro. Plants growing chilli peppers, eggplants, pineapples, snake beans (*Vigna unguiculata*), sweet peppers, and tomatoes are also grown, as are plants with edible laves such as *tu-lip* (*Gnetum gnemon*) (which also grows naturally on the island), and slippery cabbage (*Abelmoschus manihot*) (see Figure 33).

Most downhill gardens were destroyed by the tsunami and were therefore of little relevance in providing food. Additionally ocean-based livelihood activities could not be relied on. 'Fear to approach the ocean' was mentioned as the main reason for this. Additionally, fishing gear (e.g. canoes, goggles, and fishing nets, lines, hooks, and spears) had been lost or destroyed (Schwarz et al. 2007). The gardens at higher ground were largely untouched by the tsunami. Discussions following the creation of post-tsunami timelines in Pailongge and Saegeraghi indicated that these gardens were amongst the primary sources of food provision in the first days after the tsunami.

Figure 33 Impression of food grown in Melanesian Solomon Islanders' gardens
Top left: chili pepper, top right: eggplant, bottom left: sweet potato plants, bottom right: cassava plants.

The fact that Melanesian Solomon Islanders could rely on their uphill gardens for food testifies to the importance of having livelihood strategies that are diverse and complex in coping with the disastrous consequences of the 2007 hazards. The Melanesian communities' livelihood activities took place in various locations: gardens were situated on lower and higher ground and ocean-based activities took place in shallow and deep waters. This spread the risk that the main means of subsistence would all be adversely affected by a hazard. When both the ocean and the lower-lying gardens could not be relied on for the provision of food, the Melanesian Solomon Islanders

could rely on their gardens on higher ground. Another strong point of their livelihood diversification was that activities of providing food without the interference of economic transactions were spread over various locations. This secured their direct access to food and meant they could cope through self-reliance. Wild foods from the tropical rainforest terrestrial ecosystem (discussed below) were another source of direct food provision.

5.2.3.2 Wild foods

In addition to produce from gardens, wild foods from the tropical rainforest terrestrial ecosystem were a source of direct food provision. Traditionally populations throughout the Pacific, including the Solomon Islands, rely on their native tree and plant species for the provision of a wide range of products (Thaman et al. 2006). Knowledge of a large variety of such so called 'common property resources' (e.g. Chambers and Conway 1992), which are available and free for all, is inherent to the culture of Melanesian Solomon Islanders. The hills on Ghizo are home to a great diversity of edible plants; these foods are part of Melanesian Solomon Islanders' daily diet. Trees growing fruits like breadfruit (*Artocarpus altilisor*) and *noni* (*Morinda citrifolia*), or nuts like *cut nuts* (*Barringtonia procera*) and *ngali nuts* (which grow on *Canarium* tree species) cover the hills along with edible shrubs such as *ofenga* (*Pseuderanthemum whartonianum*) and wild plants locally known as *fen*, *gupo,* and *ande* cabbages (see Figure 34). Cassava and pineapple are usually planted in gardens but spread to the bush and survive there, along with swamp taro and regular taro. Some of these wild foods are known throughout the Solomon Islands whereas others are commonly found in particular parts of the country.

Figure 34 Impression of edible wild plants and trees growing on Ghizo Island
Top left: *cut nut*, top right: *noni*, bottom left: *gupo* cabbage, bottom right: *ande* cabbage.

The importance of wild foods in coping with disaster was re-emphasized amongst Melanesian Solomon Islanders during the 1997 drought. Knowledge and practices associated with this also aided coping in the immediate aftermath of the 2007 tsunami. All participants of Pailongge's and Saegeraghi's focus groups agreed on the importance of wild foods in the first days after the tsunami; this was either as a sole source of food, or in addition to produce from uphill gardens. The earthquake's frequent aftershocks caused villagers to fear moving around and going to their

gardens. This made the uphill gardens 'less accessible', and led people to rely heavily on wild foods available immediately around them.

The fact that Melanesian Solomon Islanders could rely on the common property services provided by the tropical rainforest terrestrial ecosystem again emphasized the importance of having diverse livelihood strategies, covering various locations and including activities directly providing food. This also stressed the importance of knowledge generated by a locally relevant disaster subculture; in this case the knowledge of wild foods, re-emphasised during the 1997 drought, aided in coping with the immediate disastrous aftermath of the earthquake and tsunami. This knowledge was intrinsically linked to the culture of the Melanesian Solomon Islanders; they drew on resources present in and part of their every-day life, not a separate rescue system. Yet, having access to food, whether from gardens or from the bush, without being reliant on external sources of food, is one thing. Being able to prepare it for consumption is another. Traditional means of cooking, another important feature of the Melanesian Solomon Islanders' disaster-subculture that aided their means of self-reliant coping, are discussed below.

5.2.3.3 Traditional means of cooking

Kastom cooking, referring to practices based on customs rooted in the past (Dinnen and Firth 2008) is widely practiced by Melanesian Solomon Islanders. Two main ways of *kastom* cooking are *motu* cooking and *bo-ne bo-ne* cooking. *Motu* cooking is a means of preparing food without using pots and pans. It is done by wrapping food like potatoes or bananas in banana-leaves and placing the wrapped bundle on hot stones. As the food is wrapped in a relatively airtight manner it is both steamed and roasted in the process. *Motu* cooking can be practiced in different ways: the bundled food can be positioned on hot stones on the ground, on stones in a hole in the ground, or in a 'basket' made of palm leaves and supported by twigs (see Figure 35). At times hot stones are placed in the leaves along with the food (see Figure 36). The method used depends on the materials available and the conditions of the soil and weather. The first type of motu cooking

shown in Figure 35 is most commonly used as it takes the least effort. All participants of Pailongge's and Saegeraghi's focus groups said they know how to *motu*. Some use it on a daily basis, whereas others limit its use to events like Christmas.

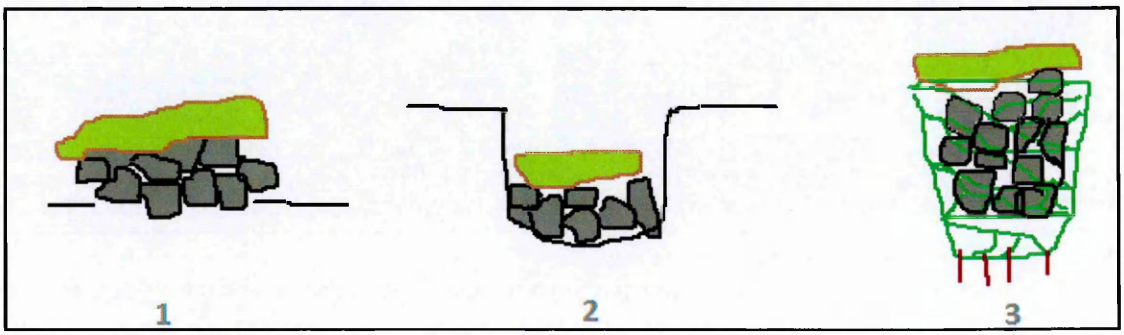


Figure 35 Three types of *motu* cooking: on the ground, in the ground, or in a woven basket
Source: author's compilation

Figure 36 Cooking potatoes the *motu* way
The potatoes and hot stones are placed in banana leaves, which are wrapped up and covered by hessian fabric allowing less steam to escape.

Bo-ne bo-ne cooking is a way of cooking that takes even less effort than *motu* cooking. Like *motu* cooking *bo-ne bo-ne* cooking has long been part of the Melanesian culture. *Bon-ne bo-ne* cooking is done by placing the food directly in the fire and turning it around until all sides are equally black (see Figure 37). The food is then taken out, the black skin of the food is taken off, and the inside is eaten.

Figure 37 Cooking bananas the bo-ne bo-ne way
Left: green bananas are placed in the fire, right: the blackened skin is peeled off and the inside is ready to eat.

The 2007 earthquake and tsunami destroyed many kitchens, and cooking utensils were washed away. Some people found or borrowed pots to cook with, while others were left without such tools. Those without cooking utensils borrowed them from others or relied on *motu* and *bo-ne bo-ne* cooking. These practices were long present in the Melanesian culture but were re-emphasized during the 1997 drought, as these ways of cooking food require no water. Another practice emphasized in 1997 and used to cope with the immediate aftermath of the 2007 hazards was the use of twigs to feed fire, as piles of dry coconut husks and firewood were washed away.

The fact that Melanesian Solomon Islanders could rely on traditional ways of cooking to prepare the food from their gardens and the bush testifies to the importance of practices that can be seen as part of their disaster subculture. This self-reliant manner of food preparation contributed to the Melanesian survivors' capacity to cope with disaster. These ways of traditional cooking are inherent to the culture of the affected villagers and developed in relation to their natural environment. After the introduction of pans these practices were maintained partly as a result of continuous living in that environment and its hazards.

The relevance of a disaster subculture and diverse livelihood strategies to coping satisfactory with the disastrous effects of natural hazards proves itself when comparing the coping mechanisms of the Melanesian survivors to those of their Gilbertese counterparts. The following sub-section discusses how the Gilbertese communities coped in anticipation of the arrival of (inter)national disaster aid.

5.2.4 Gilbertese Solomon Islanders' coping mechanisms

First day mifella kam up, mifella evri pipol stap lo bush ia. So olketa findim coconut lo bush noa, somefella olketa cuttim before, so olketa garem kaikai. Somefella pikinini go fo takim fruit. (...) Somefella struggle fo go findem kaikai, somefella struggle fo go findem haus before nait: "Ey mi go findem help lo Gizo, no gud him nait him rain." Husband blo mi him likem for mifella go lo Gizo too, but him no go first taem, him findem first taem haus blo mifella bicos haus blo mifella float go go kasim fishery, him go past lo there. Him no float nao, him on top lo stone. So him go, go insaet lo haus blo mifella. Nao wanfella pot rais blo mifella him stap insaet wea mifella cookim lo nait, him stap. So him openim, him nice rais, sea him no go insaet. So him puttim lo canoe. So him lookim lookim moa insaet lo haus, him lookim wanfella pot nao: fish. Mifella cookim too lo night ia, but him no finis him stap insaet lo pot. So him takim. But taem olketa pipol sing-out lo him: "Ey, iu go, go go, go back, someting nao kam moa ia", him leavim somefella samting, cos olketa makim fright no moa.

The first day we all stayed in the bush. Some found coconuts in the bush; someone had cut them off before the tsunami, so they got their food. Some children found fruit. (...) Some people struggled to find food and find a place for the night. [People said]: "I will go to Gizo town to find help, it is not good if it rains at night [and we are here without a house]." My husband wanted us to go

to Gizo town, but first he went to our house. Our house floated away, past the fisheries, but did not float further out, it stayed [got stuck] on top of stones. So he went to our house and went inside. One pot of rice was still where we had left it the evening before. He opened the pot of rice, and the rice was still good, it was untouched by the seawater. So he placed it in the canoe. He looked around more and saw a pot of fish. We cooked it the night before but did not finish it all, and it was still inside the pot. So he took that too. But when other people shouted out to him "Hey, go back, something [from the sea] may come again", he left some things behind, because he was frightened by what the people said.

Madelyn, Nusa Baruka, 16 March 2013

Madelyn's story is one of many stories illustrating how Gilbertese survivors' means of coping differed from those of their Melanesian neighbours. Similar to the Melanesian survivors, the Gilbertese inhabitants of Ghizo had to survive the first days without external aid. However, the factors enabling predominantly self-reliant survival amongst the Melanesian survivors were largely absent amongst the Gilbertese survivors. What the lack of gardens, knowledge of wild foods, and traditional cooking implied for the Gilbertese survivors' means of coping is explained below.

5.2.4.1 Lack of gardens, knowledge of wild foods and traditional cooking

After the tsunami, villagers of Niu Manra stayed on land on higher ground, owned by the government, just like the Melanesian survivors did. This land is formally referred to as Crown Land. The ownership of the land survivors from Nusa Baruka stayed on is subject of debate.[42] Regardless of whose land it was, the majority of Gilbertese villagers had not practiced gardening on this land. This was partly related to land tenure rights, but was also rooted in the Gilbertese

[42] Villagers from Nusa Baruka argue this land was given to them by the British government before the Solomon Islands gained independence, but they state that the government of the Solomon Islands does not acknowledge this.

culture's traditional heavy reliance on the ocean for the provision of food (see Chapter 2). Even after migrating to the Solomon Islands gardening remained of minor significance for the Gilbertese, despite younger generations learning how to make a garden in school. A group of elderly women in Niu Manra referred to the lack of gardening by stating: '*Evri Gilbert save [how to make a garden], but somefella him les* (All Gilbertese know, but some just cannot be bothered)'. The main exception to the limited practice of gardening was the planting of swamp taro in low-lying areas, a practice also carried out in Kiribati. Additionally, several mixed Gilbertese-Melanesian families in Niu Manra practiced gardening and relied on their gardens for survival after the tsunami hit. In Nusa Baruka, where the number of mixed families is much lower, gardening was not mentioned as an activity practiced prior to the tsunami, not even on a small scale. As gardening was not practiced on a large scale by the Gilbertese communities, they could not rely on gardens for the provision of food in the immediate aftermath of the 2007 hazards. Some had planted swamp taro, but in many cases these did not provide food: the leaves were destroyed by the tsunami, and although the tubers had remained in the ground, the pigs had frequently gotten to the tubers before the villagers could.

In addition to not having gardens to rely on, most Gilbertese survivors did not have knowledge of foods available through the tropical rainforest terrestrial ecosystem. Meria from Titiana[43] illustrated this by sharing her view of wild edible plants*: 'First taem me lookim bush kebis, me no like kaikaim. "That wan no kaikai", me say* (At first when I saw bush cabbage I did not want to eat it. "That is no food", I said)'. In the Gilbertese focus groups wild foods were not mentioned as having played a role in coping in the immediate aftermath of the earthquake and tsunami. In individual conversations wild fruits (coconuts and 'five corners' (*Averrhoa carambola*)) were at times mentioned, but also here no mention was made of the wide range of wild foods that need to be cooked in order to be consumed. With the exception of coconuts and five corners, the Gilbertese survivors hardly relied on the land for food provision to survive. Again, the mixed

[43] The conversation with Meria on 16 March 2013 started off as an informal conversation. However, as she shared such interesting insights, I asked her if I could quote her in my research, of which she approved.

Gilbertese-Melanesian families were an exception to this. In these families wild foods like *tu-lip* were mentioned. These were also the only families mentioning the use of *motu* cooking to be able to prepare food. They assigned the use of *motu* to the mixed composition of their families. In this sense, the knowledge of *motu* cooking was a way in which the Melanesian inhabitants in Gilbertese villages contributed to the survival of the Gilbertese group through emergent, self-organising response efforts. Jean, a Melanesian woman married to a Gilbertese man and living in Niu Manra, argued that her fellow Gilbertese villagers did not know how to practice the Solomon Islands' way of *motu* cooking. She explained (2 June 2012):

> *Me cookim cassava pudding. Gilbert him like for kaikaim but him no makim. Him no save fo makim. But taem after tsunami hemi kam, me motu and motu, and him like fo learnim. Bifo him no interest.*
>
> I cooked cassava pudding. The Gilbertese liked to eat it, but they did not make it themselves. They did not know how to make it. After the tsunami I *motu*-cooked a lot and they wanted to learn it. Before the tsunami they had no interest in learning it.

One of Niu Manra's research participants explained that there is a kind of *motu* cooking practiced in Kiribati, but that the 'small, white stones' used are different from the ones used in the Solomon Islands. He was likely referring to coral stones, as described by Di Piazza (1998), whereas in the Solomons stones are used which differ in use and durability (Davidson 1971). The move to a context in which stones traditionally used for *motu* cooking were not available appears to have contributed to the loss of this practice. It serves as another example of the difficulties Gilbertese face in maintaining their culture, as addressed in Chapter 2. Additionally, it can be questioned how strongly embedded *motu* cooking was in the Gilbertese culture; Kiribati's people traditionally have a strong reliance on the ocean, and fish is frequently consumed raw or is smoke-dried as a

means of food preservation for times when access to fresh fish is limited. Also, the quality of the soil and flora in Kiribati is poor (Thomas 2003), and it covers far less indigenous (edible) plant species than the Solomon Islands do (Thaman 1990). These conditions do not favour a strong reliance on produce from the land (gardens or bush) or on practices of food preparation in relation to this. Such practices were also not emphasized during the 1997 drought. The Gilbertese communities' lack of knowledge of wild edible foods and *motu* cooking implied that this knowledge could not be drawn upon to cope with the disastrous consequences of the 2007 hazards. Considering that the Gilbertese survivors, like the Melanesian survivors, were afraid to approach the sea, they had to find other strategies of survival to deal with the immediate disastrous impacts of the hazards. How they coped is discussed below.

5.2.4.2 Methods of coping

A lack of gardens, combined with having little knowledge of wild foods and *motu* cooking, made coping in a self-reliant manner difficult for Gilbertese survivors. Discussions following the creation of post-tsunami timelines in Nusa Baruka and Niu Manra indicated that the main sources of water and food were the water and meat of young, green coconuts. Additionally, some people found dry, mature coconuts, and several people in Niu Manra stated they took dead fish from the shoreline a few hours after the tsunami hit, and prepared them the *bo-ne bo-ne* way. Some remaining tubers of swamp taro were mentioned as a source of food in Niu Manra as well. Mixed Gilbertese-Melanesian families living in Niu Manra referred to produce from gardens, wild foods and *motu* cooking for survival. Paulus, a Melanesian Solomon Islander living in Niu Manra added that although Gilbertese people were reluctant to eat wild plants, they had to in order to survive.

Nevertheless, with the exception of those married to Melanesian Solomon Islanders, the Gilbertese survivors had little relevant endogenous coping mechanisms to rely on and were much less self-reliant than the Melanesian survivors were. They had no consistent means of food provision. The majority of the Gilbertese survivors had to rely on ready-to-eat food they found or

that was given to them. A few people in Niu Manra received food from a *wantok* in Gizo town: a woman from Niu Manra married to a Chinese shop-owner. Some people went over to Gizo town to search the debris for food. A few others mentioned they found food and pots in the remains of their homes, or the homes of others. Houses that were not completely destroyed but merely slanted were particularly subject to scavenging, a practice that increased as the days passed by and food became harder to find. This demonstrates that most Gilbertese survivors' means of coping were not sustainable solutions to the immediate problems caused by the tsunami. The Gilbertese communities survived but they did not cope in a self-reliant and sustainable manner, and their struggle for survival became increasingly pressing by the day.

5.2.5 Means of coping and resilience to the 2007 hazards

In addition to differences in the reactions of Ghizo's Gilbertese and Melanesian ethnic groups, the data presented above show similar differences in their coping mechanisms for survival in the immediate aftermath of the 2007 earthquake and tsunami. Two factors, disaster subculture and livelihoods influenced the communities' coping capacities in an entwined manner. The Melanesian Solomon Islanders relied on produce from their gardens, wild foods, and traditional means of cooking for survival; they were self-reliant in their food provision and preparation, and had a strong endogenous coping capacity to limit and deal with the disastrous impacts of the hazards. Their mechanisms for coping could have been sustained over an extended period of time if needed, which is of tremendous importance for communities living in non-industrial, isolated places as the timely provision of disaster aid to such areas often faces great challenges (Gaillard et al. 2009, Paton et al. 2006, Mercer 2004). The Gilbertese Solomon Islanders had few gardens to rely on, and limited knowledge of wild foods and traditional means of cooking. They largely survived by receiving food or finding food in tsunami-debris, but were not able to deal with disaster in a self-reliant and sustainable manner; in comparison to the Melanesian Solomon Islanders they had a weak endogenous coping capacity. If disaster aid had not arrived after a few days, the Gilbertese would likely have experienced a sustained period of disequilibrium. The

mixed Gilbertese-Melanesian families were exceptions to this, as shifting cultural boundaries made them more capable of addressing disaster. However, as the mixed couples lived in Gilbertese villages, the Melanesian partners learned more about, and adapted more to, the Gilbertese culture than the reverse. This limited the opportunities for extensive exposure to and uptake of Melanesian practices by the Gilbertese ethnic group.

These findings demonstrate that the resilience of the communities to the 2007 events was shaped by the strength of diversification of livelihoods and the presence or absence of a disaster subculture, listed as characteristics of a resilient society in Table 5 in Chapter 3. This does not mean that the Gilbertese did not have any practices and knowledge that can be seen as part of a disaster subculture; they dealt well with the 1997 drought. Rather, this implies that the Gilbertese disaster subculture was not suitable for dealing with the disastrous consequences of hazards not frequently faced in Kiribati. As they were not adversely impacted by the 1997 drought, they did not develop or emphasize practices and knowledge that could have strengthened their capacity to cope in the immediate aftermath of the 2007 earthquake and tsunami. The findings also confirm Gaillard et al.'s (2008) and Paton et al.'s (2006) argument that differences in the availability of and access to resources are of influence on the capacity to cope with disaster; the Gilbertese Solomon Islanders' coping capacity was weaker than that of the Melanesian ethnic group (see Table 13). These differences in the availability of and access to resources can largely be ascribed to differences in the (historical) socio-cultural context of the Melanesian and Gilbertese ethnic groups, illustrating how ethnicity as a product of human agency relates to differences in coping mechanisms.

In brief, when examining the four communities' means of coping as part of their responses, and viewing their capacity to respond as indicative of their resilience, it can be argued that variations in the communities' coping mechanisms contributed to variations in the ethnic groups' resilience

to the 2007 events: the Gilbertese ethnic group was less resilient to the events than their Melanesian neighbours.

Table 13 Capacity to cope: differences in ethnic groups

Phase of disaster management					***Findings***
Phase 1	RESPONSE	*How communities dealt with disaster*	Stage 1	Initial reaction	Melanesian ethnic group's capacity to react > Gilbertese ethnic group's capacity to react
			Stage 2	Coping mechanisms	Melanesian ethnic group's capacity to cope > Gilbertese ethnic group's capacity to cope

5.3 Conclusion

By evaluating how ethnically diverse communities on Ghizo reacted to and coped with the 2 April 2007 Solomon Islands' earthquake and tsunami, this chapter addressed sub-question A of the research questions: How did ethnically different communities respond to the same event? It was explained that response and recovery are seen as two phases encompassing all processes of disaster management (the processes of managing the disastrous consequences of hazards), and that response is divided up into two stages: the communities' initial reactions to the events, and their subsequent coping mechanisms.

Section 5.1 analysed how two Gilbertese and two Melanesian communities reacted to the earthquake and tsunami. It became clear that communities' reactions to the hazards were heavily influenced by three factors. The first factor was locally relevant knowledge of tsunamis and tsunamigenic earthquakes. Contrary to common understandings in academic literature on the 2007 events, this knowledge was not indigenous to the researched location but was transferred from other in-country locations and other parts of the world. This showed that knowledge globalised by public and popular media has the ability to influence hazard-related protective

behaviour, although it often has limited ability to increase awareness of local disaster risks. Illustrating the potential of combining popular knowledge based on similar hazards elsewhere with knowledge generated in the country, supports a rethinking of academia's frequent emphasis on scientific and local knowledge when referring to combining knowledges to increase resilience (see Chapter 3). Any knowledge that has the potential to facilitate processes of responding to hazardous events should be considered a precious resource, regardless of its source. Initiatives or programmes on disaster risk reduction should be open to, and provide support for, such mixing of knowledges. Awareness of locally popular practices, such as the film evenings, as means to facilitate the uptake of relevant knowledge, plays a key role in this. The second factor, the local physiography, showed that natural features frequently described in academic literature as 'first lines of defence' can also obstruct the escape from coastal hazards. Mangroves, for example, can reduce the speed of oncoming waves, but people living in mangrove forests can also get trapped in its tangled roots. Such features can therefore at times be viewed in ambiguous ways by those who have experienced a hazard in which these features played both positive and negative roles. Specifically how this experience subsequently shaped survivors' behaviour with regard to such features is discussed at a later point in this thesis. The third factor, footpaths associated with gardening, illustrated that people's capacities to react cannot be dissociated from their livelihoods. This advances the understanding of the ways in which 'diversification of livelihood activities' (as listed as a characteristic of resilient societies in Chapter 3) can contribute to resilience; it showed that it can influence people's capacity to react, not only their capacity to cope as commonly emphasised in literature. Combined, the three factors discussed shaped the initial reactions of the four communities in such ways that differences in reactions between communities correlated with the different ethnic groups the communities place themselves in. As the capacity to react is indicative of the capacity of resilience, these findings show that variations in ethnic groups' initial reactions reflect variations in the ethnic groups' resilience.

Section 5.2 analysed how the four communities coped in the immediate aftermath of the hazards. It illustrated that two factors, disaster subculture and livelihoods, heavily shaped the communities' coping mechanisms in an entwined manner. How both ethnic groups coped emphasised the importance of the strength of livelihood diversification by drawing attention to the relevance of having food-producing livelihood activities in various locations. Whereas the Melanesian communities could rely on their gardens on higher ground as well as on edible plants from the tropical rainforest terrestrial ecosystem, the Gilbertese communities faced greater challenges in surviving in a self-reliant manner. The Melanesian survivors coping mechanisms were informed by practices re-emphasised during the 1997 drought, which had adversely affected the Melanesian Solomon Islanders. The findings presented in this section therefore emphasise the positive contribution a disaster subculture can make to coping with disaster. By doing so, it is illustrated that categorisations of hazards frequently used in science (e.g. climatic hazards and geological hazards) may lose their meaning or importance in a local context in which other categories appear to be of greater relevance- in this case water-related hazards. Finally, recognising that practices and behaviours related to ethnic identities, can cause differences in the ways diverse ethnic groups inhabiting the same area are impacted, is crucial in understanding why such neighbouring groups may not equally develop a disaster subculture.

By exploring how the four communities coped it became clear that disaster subculture and livelihoods shaped the coping mechanisms of the communities in such ways that that differences in coping mechanisms between communities correlated with the different ethnic groups the communities belonged to. The patterns draw attention to the importance of self-reliance in maintaining a state of equilibrium. Coping can therefore be understood not simply as surviving but as dealing with disaster in a self-reliant manner that can be sustained over time. This difference is of crucial importance in dealing with the salient damage of rapid-onset hazards, particularly in isolated areas in developing countries, as it may take days before disaster aid

reaches arrives. As coping capacity is indicative of the capacity of resilience, these findings show that variations in ethnic groups' capacity to cope, can contribute to variations in their resilience.

These findings show that ethnic groups inhabiting the same region can be affected by the same hazard in dissimilar ways, and that the causes of this lie in contextual variations influencing the access to and use of resources, knowledge being an important one of them. However, it must be stressed that the availability of resources, and having access to these resources, means very little in the absence of agency. As explained in Chapter 3, agency is understood to mean the capacity of people to play an independent causal role in history, thereby overcoming the viewpoint that people are powerless victims of disaster (Brown and Westaway 2011). It relates to the notion of power, not in the sense of the relations between individuals or groups in a social setting (as discussed earlier in relation to Foucault's work), but in the sense of the power related to the drive and motivation of people facing threats posed by disaster. Despite characterised by differences in their ability to cope in practice, both ethnic groups were not passive actors or 'powerless spectators' (Fabricus et al. 2007). It is this element of willpower, in combination with the access to resources related to livelihoods and disaster subcultures, that shaped people's resilience in the response phase. In sum, this chapter provided more insight into the idea that the conditions of survivors' daily lives influence their resilience and that differences in ethnicity can give shape to this process in a complex manner. This chapter therefore confirms that analysing communities' post-disaster processes provides valuable information on their resilience to the events faced.

The next chapter will show how the arrival of disaster aid marked a transition to recovery and overcoming disaster. It addresses how the arrival of aid reduced the need to demonstrate resilience in the aftermath of the 2007 earthquake and tsunami, and how aid interventions were perceived by the affected communities. How findings presented in the current chapter and the following chapter influenced socio-cultural recovery and developments that are indicative of the affected communities' resilience to future disaster, is discussed in Chapter 7.

Chapter 6

Uncovering local perceptions of disaster aid interventions

Evri NGOs makim guuuuuud something. Only taim wakamen him go raon, that problem. Wan, wan, sem people receivim. Ota givim sam people. Me no save how nao that happen. Ota no work together. (...) So, rawa him kam up. Staka. Time ota distributim tings, taim olketa givim. Osem. Rawa kam.

All the NGOs did a very good job. It was only when the labourers [Solomon Islanders] went around [to the affected villages] when the problems started. One [item of aid], one, some people received. They gave it only to some people. I don't know how that happened. They didn't work together. (...) So, conflict arose over this. A lot of conflict. When they distributed things, when they gave things away. Like that. Conflict arose.

Tilda, Pailongge (22 March 2013)

Three to four days after the tsunami, aid[44] started to arrive on Ghizo Island. For Ghizo's affected populations this meant a very clear shift away from a phase characterised predominantly by community response and reliance upon localised in-island resources. Inhabitants from Melanesian Pailongge and Saegeraghi, and Gilbertese Niu Manra and Nusa Baruka said nothing but positive things about the initial humanitarian aid which brought an influx of emergency relief supplies. However, as Tilda's quote indicates, as aid continued to come in, it resulted in rivalry within and amongst affected communities.

Chapter 3 explained that disaster management is viewed as consisting of two phases: response (addressed in Chapter 5) and recovery. As will be explained in this chapter, participants described

[44] Section 6.2 provides more information on the nature of the initial aid and who provided it.

the arrival of aid as a transition to recovery and to overcoming disaster, as the aid interventions largely focused on recovery and rebuilding lives. Hence, this chapter addresses aid intervention as part of this second phase of disaster management (see Table 14). The choice of separating the aid interventions from the first phase of disaster management is strengthened by Rose's (2004) argument that external assistance cannot be viewed as part of community disaster response, as the latter emphasises a community's capacity to limit and deal with disaster on its own.

Table 14 Recovery
This chapter addresses the second phase of disaster management, the communities' recovery or processes of overcoming disaster (indicated in grey).

Sub-question A	*Ch. 5*	RESPONSE	*How communities dealt with disaster*	Stage 1: initial reactions Stage 2: Coping mechanisms
Sub-question B	*Ch. 6*	RECOVERY	*How communities overcame disaster*	
Sub-question C	*Ch. 7*			

This chapter investigates how aid interventions related to the 2007 earthquake and tsunami were received and perceived by Ghizo's affected Melanesian Solomon Islanders from Pailongge and Saegeraghi and the Gilbertese Solomon Islanders from Nusa Baruka and Niu Manra. The term 'aid interventions' in this context refers to all aspects of the provision of disaster aid from national and international sources to the affected people. It touches on humanitarian aid (here defined as aid with a dominant focus on immediate relief, safety, security, health and wellbeing) aimed at preventing the disaster from escalating and stabilising the emergency situation. It also includes the subsequent aid that focuses more on recovery and rebuilding lives.

The chapter addresses sub-question B of the research questions: How did aid interventions influence communities' disaster management processes? By doing so it contributes to answering the main research question: 'In the aftermath of the 2007 Solomon Islands earthquake and tsunamis, how have disaster management processes informed community resilience?'. As discussed in Chapters 3 and 5, research on disaster management can provide valuable

information on how resilient communities were to the disaster they experienced (Aldrich 2012, Bird et al. 2011), as well as providing information on changes made in the recovery process that influence communities' future disaster resilience (Birkmann 2010, Manyena 2006). Disaster aid interventions influence communities' socio-cultural recovery, argues Christoplos (2006), and decisions made during aid interventions can have long-term implications (at times referred to as secondary effects of aid) for the affected population (AEMI 2011, Birkmann 2010, Mulligan and Shaw 2007). Despite the lack of systematic analysis of how disaster aid erodes or enhances resilience, it has been observed that processes of recovery-planning can instigate changes in affected people's resilience to future disaster (Birkmann 2007, Berke and Campanella 2006).

To explore sub-question B, this chapter's first section, 6.1, explains how the arrival of aid reduced the need to demonstrate resilience in the aftermath of the 2007 earthquake and tsunami. In section 6.2 the influx of humanitarian aid and survivors' perception of this aid is analysed. By explaining how the arrival of tents meant a transition to recovery for many survivors, this section links to section 6.3, which explores disaster aid interventions with less of a humanitarian character and more of a focus on recovery. Two thematic areas around which survivors' frustrations and disapproval with these aid interventions are centred (the lack of an organised approach in assessing survivors' needs, and power relations in combination with the aid donors' choice of personnel) will be discussed in this section's sub-sections. How these areas influenced aid interventions according to the research participants is evaluated in section 6.4. Section 6.5 presents the conclusion, illustrating that whilst pre-existing social relations of power intensified during aid interventions, changes in the dynamics of pre-existing power relations impacted more profoundly on the disaster-affected communities' recovery processes.

As the focus of this research is on community-level, aid interventions are discussed in the light of the way in which they were perceived by the four communities. However, to cross-check data, Solomon Islands' based spokespersons of World Vision, Red Cross, Oxfam, and the NDMO were

also interviewed. These NGOs and governmental institution were all involved in the disaster aid interventions.

6.1 The arrival of aid: a reduction in demonstrating resilience

As argued in previous chapters, community resilience is viewed as a community's capacity to deal with and overcome the damage brought by the occurrence of hazards in order to obtain an acceptable and satisfactory standard of living, whether this implies a return to the pre-disaster social fabric or through accepting change. This indicates that aid interventions external to the daily routine of a community are not part of that community's resilience (Rose 2004); communities who have to rely on external aid in order to survive demonstrate less resilience than those who have the capacity to deal with and overcome disaster on their own (Aldrich 2012). Whereas chapter 5 revealed plentiful differences in Ghizo's ethnic groups' responses, suggesting differences in their resilience at that moment in time, it is more difficult to observe and analyse variations in resilience in the recovery phase. Initiated by a large influx of disaster aid, this phase provided external support to communities and thus reduced the need for them to display resilience. This was partly related to the abundance of aid undermining the need for communities to use endogenous means to weather disaster, and partly to the importance communities ascribed to intra-community egalitarianism during the humanitarian intervention. Intra-community, or intra-*wantok*[45], equality in aid entitlements was ranked very high: the general opinion within communities was that whether individuals belonging to that community managed to cope on their own or not, everyone in the community should have the same right to assistance in the immediate aftermath of the hazards. This idea of 'equal access to aid' was at times extended to other communities belonging to the same ethnic group, but was very limited between ethnic groups. Hank from Pailongge phrased the concern with equality in aid entitlements as (15 March 2013):

[45] The majority of each community belongs to the same *wantok* group. This notion is stronger within the Melanesian communities as the term *wantok* is traditionally used in the Melanesian context (see Chapter 2).

> If the thing is to apply the human right, there is no discrimination, no matter [how] hard time is, everyone has to receive [an] equal [share] (...) because that person [who is] even only partly affected, is part of the community, and the whole community is affected by the disaster.

The idea that the provision of aid should not be based on the extent to which one manages to cope or the extent to which one is affected, is not only observed in the affected communities but also in Solomon Islands-based organisations providing aid. Rex, who at the time of the earthquake tsunami worked for Oxfam Solomon Islands and was involved in this organisation's provision of disaster aid, illustrated this with regard to the distribution of iron roofing sheets to survivors who lost their homes (26 March 2013):

> Almost everybody dreams of having an iron-roof house. Some people, whose houses were not completely destroyed, said their houses were destroyed, or destroyed their houses themselves. We didn't say 'but your house was not destroyed'. If we do this it would create some kind of disharmony in the community.

Both influenced by the large influx of aid and the principle of egalitarianism, the arrival of disaster aid resulted in a reduction of the communities' necessity to deal with disaster on their own. In line with Campbell (1990) and studies presented in Tierney (2001) (e.g. Oliver-Smith 2001, Berke and Beatley 1997, Oliver-Smith and Goldman 1988, Harrell-Bond 1986), this resulted in survivors starting to adopt attitudes and behaviours impeding self-reliance. As discussed in Chapter 3, criticism levelled at aid interventions suggests that disaster aid can disrupt affected populations' means of dealing with disaster to a point of no return, resulting in an increased dependency on aid (e.g. Cijffers 1987, Torry 1978, Waddell 1974). Although the research on the Solomon Islands does not justify such a strong conclusion, it is argued that due to the arrival of disaster aid it

becomes difficult to make conclusions on affected communities' own capacities to deal with or overcome the adverse consequences of hazards. Investigating disaster management processes that are influenced by external aid interventions therefore provides limited information on how resilient the communities were to the disaster faced. However, it does contribute to expanding the necessary knowledgebase that enables a better understanding of how to build resilience to future disaster (Birkmann 2010). The next two sections therefore investigate the aid interventions following the 2007 Solomon Islands earthquake and tsunami.

6.2 Stabilising emergency: the influx of humanitarian aid

In discussions following the creation of post-tsunami timelines (see Chapter 4, f or a description of this method), inhabitants from Nusa Baruka, Niu Manra, Pailongge and Saegeraghi displayed great similarity in identifying two phases of disaster management distinguished by the (lack of) self-reliant coping in the first phase (the response phase covered in Chapter 5), and the absence of needing to do so in the second phase (the recovery phase),which was initiated by the arrival of disaster aid. The initial disaster aid (e.g. food, water, medicine, cooking utensils, tents, and clothes) was aimed at stabilising the emergency situation: limiting the adverse effects of the situation and preventing it from getting worse. Such aid is often referred to as emergency humanitarian response aid (e.g. De Ville de Goyet and Morinière 2006, Bakewell 2000), emergency aid (e.g. Telford and Cosgrave 2007) or humanitarian (relief) aid (e.g. Mulligan and Nadarajah 2011, Twigg 2001). In order not to overlook the humanitarian character (the focus on immediate relief, safety, security, health and wellbeing) of this type of aid, it is referred to by the term 'humanitarian aid'. This term also sets this aid apart from aid with more of a focus on recovery, following the provision of humanitarian aid.

A swift and generous delivery of humanitarian aid immediately after a disastrous event is characteristic of disaster aid interventions (e.g. Mulligan and Shaw 2007, Christoplos 2006). On the islands affected by the 2007 earthquake and tsunami, humanitarian aid was supplied at a

governmental level via the NDMO, the National Disaster Council (NDC), and RAMSI (World Health Organisation (WHO) 2007). Additionally, the Australian Agency for International Development (AusAID) (AusAID 2007), New Zealand's International Aid and Development Agency (NZAID) (NZAID 2007), and Japan International Cooperation Agency (JICA) (JICA 2007) provided aid of a humanitarian character. NGOs present were International Caritas Federation (through Caritas New Zealand and Caritas Australia) (WHO 2007), Christian World Service, ChildFund New Zealand, Save the Children (Australia, New Zealand, and Solomon Islands), Adventist Development and Relief Agency (UNOCHA 2007), Oxfam (Australia, New Zealand, and Solomon Islands) (Oxfam Australia 2009), World Vision (Australia, Solomon Islands) (UNICEF 2007b) and ShelterBox (ShelterBox 2007). Some of these were already present in the country prior to the earthquake and tsunami (e.g. Oxfam Solomon Islands, Save the Children Solomon Islands and World Vision Solomon Islands), but most NGOs came in after the events. Furthermore, the UN was involved in the provision of humanitarian aid through the WHO and UNICEF (UNICEF 2007b). Additional aid was provided by the International Federation of Red Cross (IFRC), New Zealand Red Cross (New Zealand Red Cross 2007), and Solomon Islands Red Cross (Australian Red Cross 2007).[46] The majority of these aid donors were also mentioned in the post-tsunami timelines created by focus groups participants in the Melanesian and Gilbertese villages (e.g. see Figure 38), in which supplies donated by churches were also frequently mentioned.

[46] There was a lack of coordination amongst aid donors at the time of the 2007 Solomon Islands earthquake and tsunami (Oxfam Australia 2007). As a result there is a lack of combined documentation on the provision of humanitarian aid (NDMO 2007), with no centralised record of who provided what, when, and where. Hence, it is not known if this overview of humanitarian donors is complete, nor is it known if all these donors were active on Ghizo or other parts of the affected area. At times aid provided by the donors mentioned above was shipped or airlifted to Honiara, from where it was distributed to the affected islands, without keeping track of which islands received what.

Figure 38 Section of the post-tsunami timeline created by Niu Manra's research participants
Source: Focus group Niu Manra (NMSS), 2 June 2012

In two out of four focus groups carried out in the villages, particular mention was made of the positive work of Oxfam in this humanitarian phase and three out of four focus groups positive opinions on the work of Red Cross were voiced. The reasons for this, as provided by the participants, were the timely arrival of the organisations and the suitability of their aid. '*Red Cross hemi kam kolsap lo tsunami and providim rait kind of aid* (Red Cross arrived soon after the tsunami and provided the right kind of aid)', stated Saegeraghi's focus group participants. When referring to the right kind of aid the provision of food, water, medicine, cooking utensils, tents, and clothes (see Box 1) were most frequently mentioned in the four focus groups. The provision of these kinds of aid is confirmed by the disaster management coordinator of the Solomon Islands Red Cross at the time of the 2007 tsunami as well as in the IFRC's Operations Update of 24 January 2008 (IFRC 2008).

What constituted suitable humanitarian aid in the opinion of Ghizo's survivors is in line with the

Sphere Project's[47] (2011: 24) description of the minimum requirements for adequate standards of living that disaster-affected people should have access to: water, sanitation, food, nutrition, shelter and healthcare. These standards shape the responses of a large number of NGOs providing humanitarian aid. Research on Ghizo indicated that humanitarian aid tailored to these standards met the needs of most, if not all, survivors.

Box 1 Clothes as humanitarian aid

The mention of clothes is an interesting example of 'right' aid. Until the first missionaries arrived in the country in the early 1840s, Solomon Islanders were mostly semi-naked, only covering their genitals (McCane 2004). The missionaries' Christian teachings instructed them to wear clothing, and being seen naked is nowadays considered as something exceptionally humiliating. As many clothes were lost in the tsunami (see Figure 39), clothes were seen as an immediate need by survivors.

Figure 39 Clothes as much needed humanitarian aid
Entries of impact diagrams created in Pailongge (left), Niu Manra (centre), and Nusa Baruka (right) illustrate the concern with having no clothes. In Nusa Baruka it was stated this negative impact of the tsunami resulted in a positive impact: an abundance of clothes provided by humanitarian aid organisations.
Sources: Focus group Pailongge (16 May 2012), Niu Manra (NMT) (9 June 2012), and Nusa Baruka (5 May 2012)

Although the tsunami caused different losses and needs amongst Gilbertese and Melanesian survivors, the humanitarian aid provided was perceived as positive by both groups. Such appraisal is not unique to this particular situation: Mulligan and Nadarajah (2011), Keraminiyage et al. (2008), Telford and Cosgrave (2007), and Christoplos (2006) studied survivors' perceptions of humanitarian aid donated in response to the 2004 Indian Ocean tsunami, and drew similar conclusions. Mulligan and Nadarajah (2011: 5) claim that:

[47]The Sphere Project is a voluntary initiative that brings together a wide range of humanitarian agencies around a common aim: to improve the quality of humanitarian assistance and the accountability of humanitarian actors to their constituents, donors and affected populations (Sphere Project 2011: 1).

> In the first stages of relief, there is little need for community consultation because the key aim is simply to make sure that the immediate needs of all the disaster survivors are looked after with maximum speed and efficiency.

This is a statement fiercely contested by Amarasiri de Silva's (2009) research on the same event, focusing on a district also covered by Mulligan and Nadarajah (2011). Amarasiri de Silva's (2009: 270) work on the role of ethnicity in humanitarian aid allocation concludes that aid distribution was not very successful, as it 'ignored local social structures and networks, leading to division and inequality'. Such local structures could be seen as associated with the classification of ethnic groups. Conversely, Christoplos' (2006: 32) study of the post-tsunami aid distribution in nine districts in Sri Lanka (including the district researched by Amarasiri de Silva) argues that although the tsunami affected ethnically different areas, humanitarian aid was generally perceived to have been fairly equitably distributed.

On Ghizo, no mention was made of inequality at this stage of disaster aid intervention. Hence, in line with Christoplos' (2006) and Mulligan and Nadarajah's (2011) findings, the analysis of survivors' perceptions of humanitarian aid on Ghizo indicates that the focus on speed and suitability is of greater significance in the immediate aftermath of disastrous hazards than a thorough consultation of (ethnic) communities' needs. Food, water, shelter, sanitation, and medicine are basic needs for almost all disaster-survivors, and these needs were similar amongst all affected groups on Ghizo. Of all humanitarian aid received, tents played a special role in stabilising the emergency situation.

6.2.1 The arrival of tents

The provision of tents and tarpaulins serving as tents (e.g. see Figure 40), meant for many survivors the first real stabilisation of the emergency situation: they had a place to live again. How long they lived in these tents varied according to both intra- and inter-group dynamics. In

Pailongge survivors stated that most lived in tents for three to four months, although other sources of information (e.g. People First Network 2008) indicate this lasted longer. A similar period of time was mentioned in Nusa Baruka, whereas in Niu Manra survivors stated they lived in tents for over a year. Exposed to the elements and daily wear and tear tents did not last long, but as humanitarian aid was plentiful, broken tents were easily replaced by other tents. Trauma and fear of a repetition of the hazards were dominant factors influencing a prolonged period of living in tents in all villages. Studies on tsunami-survivors show that years after the tsunami fear can still prevent people from rebuilding their homes and obtaining an acceptable and satisfactory standard of living (e.g. Davidson 2006, Rodriguez et al. 2007).

Figure 40 Tarpaulin tent functioning as makeshift school
This photo was taken on Ranongga Island, neighbouring Ghizo Island, which was also severely affected by the 2007 earthquake and tsunami.
Source: McDougall et al. (2008).

Further complicating the restoration of daily routines were insecurities with regard to permanent settlement on higher ground. Due to unresolved landownership issues on Ghizo, permanent places for relocation were not identified, complicating the resettlement of all internally displaced survivors (Office of the High Commissioner for Human Rights (UNOHCHR) 2011), but particularly

of the Gilbertese. Most people in Melanesian Saegeraghi and Pailongge hold *kastom (*customary) land rights to the Crown land on Ghizo and feel that the government acknowledges this. Therefore they comfortably live on this land despite not (yet) having official rights to it. The Gilbertese' rights to land are disputed. They state that part of the land given to them under the British colonial administration is not acknowledged as rightfully theirs by the Solomon Islands' government. This concerns the land on higher ground behind their villages (Nusa Baruka in particular), as Gilbertese migrants initially settled at the coast and did not use the land on higher ground. Yet, fear of another tsunami was a major factor influencing all survivors' desires to move to higher ground. However, the controversy over land rights acted as a disincentive to rebuilding on higher ground, influencing the duration that (predominately Gilbertese) survivors lived in tents. Although much of the land issues on Ghizo are linked to tensions between the two ethnic groups, it illustrates the overall marginalisation of disaster survivors in relation to land, as detailed by Cosgrave (2007), Walter (2004) and Perera (2005). The latter provides an illustrative example of how rebuilding in multi-ethnic areas where access to land is a sensitive issue due to ethnic groups' ties, and at times perceived rights, to land, can increase conflict risks.

As indicated above, survivors viewed having shelter as a stabilisation of the emergency situation. It marked the transition to the next phase of disaster management: a phase with a focus on recovery. 'Recovery is context- and location-specific and defined by the affected people as they move away from emergency conditions', argue Telford and Cosgrave (2007:15). Ghizo's affected villagers defined recovery as the process initiated by the arrival of tents. Unlike various aid donors (e.g. Oxfam), who referred to the first month after the events as 'emergency', and then moved to 'reconstruction' before making mention of 'recovery', Ghizo's survivors only spoke of recovery after the arrival of tents. Acknowledging the complexity of separating out phases of disaster management and the importance of hearing local voices (see Chapter 3), the phase initiated by the arrival of tents is here called recovery. The main activities of this phase lasted until late 2010, and are largely characterised by disaster aid interventions aimed at recovering and rebuilding

lives, although at the start of this phase aid was still of a humanitarian character.

6.3 Beyond stabilising emergency: towards recovery

In addition to illustrating the transition to recovery, sub-section 6.2.1 showed that pre-tsunami ethno-political issues, the manifestation of which were minimised during the emergency phase, returned with the move away from a sole focus on stabilising emergency. Disaster aid interventions generally become less straightforward with the move towards a re-establishment of basic services, infrastructure and activities. This implies that more attention should be paid to the local context and to the strategies and quality of aid interventions, a finding echoed by Telford and Cosgrave (2007). Failing to do so results in increased weaknesses and bad practices in aid interventions, and in a decline of survivors' high levels of satisfaction with humanitarian aid (Telford and Cosgrave 2007, Brusset et al. 2006, Christoplos 2006). As section 6.2 illustrated, Ghizo's survivors regarded humanitarian aid largely positively because of its suitability and timely delivery. However, as the focus on recovery increased, aid interventions started to be labelled as 'bad' and were discussed with disapproval.

Fieldwork on Ghizo put forward thematic areas around which survivors' frustration and disapproval with aid interventions were centred. Sub-sections 6.3.1 and 6.3.2 discuss these thematic areas. Section 6.4 analyses how they shaped survivors' perceptions of aid interventions aimed at recovery, explaining survivors' dissatisfaction and disapproval with these aid interventions.

6.3.1 Cooperation and collaboration in assessing needs

A first thematic area around which survivors' frustrations and disapproval with aid interventions were centred, addressed problems of poor coordination and collaboration between various aid organisations. In the weeks following the initial influx of humanitarian aid, donors carried out large numbers of needs assessments (UNICEF 2007). Ghizo's survivors argued there were too

many assessments, and too much overlap between them. Charles from Saegeraghi explained (20 March 2013): '*Samtaem olketa waitmen doim assessment, samtaem olketa Solomon men. Sem assessment him doim, sem assessment. Why noa sem assessment? Mifella questionim that wan.* (Sometimes white men [expats] would conduct assessments, sometimes Solomon Islanders. They carried out the same assessment, the same assessment. Why the same assessment? We wonder about that.)' Additionally, the assessments were of a time-consuming nature. Combined, this provoked feelings of frustration amongst the survivors. Interviews with aid organisations involved in the disaster aid intervention on Ghizo confirmed the lack of coordination and sharing of assessments. Poor preparedness was one of the reasons for this, argued the country director of World Vision Solomon Islands (27 March 2013): 'The NDMO was not really prepared. Basically they struggled to control the emergency and provide direction for the response'. The NDMO's spokesperson indicated the same, as well as drawing attention to the large number of needs assessments to satisfy aid donors' own requirements and interests (26 March 2013):

> During the first few weeks from the event there was quite a duplication of the role; everybody is rushing to the scene and trying to give. Because before everybody went to Ghizo, there was no understanding and no agreement... no assessment form. So that is why they [survivors] experience[d] so many people going, so many organisations going to the same communities, asking the same questions. (...) We are [were] all working on a specific issue, but we would like to know some other issues even though it is not exactly covering parts we are working on.

De Ville de Goyet and Morinière's (2006) account of needs assessments following the Indian Ocean tsunami concludes that the coordination of needs assessments was most effective in countries with a strong government, amongst others characterised by a well-diversified economy and strong financial position. In such countries serious efforts were made towards international

coordination of the assessments. The Solomon Islands' lack of national identity (Bennet 2002), the *wantok* system (see Chapter 2), and weak and unstable political parties (Fukuyama 2008) are indicators of a weak national government. It can therefore be argued that it is not without surprise that poor coordination and cooperation were said to have characterised needs assessments, resulting in multiple and overlapping assessments.

These findings on aid coordination and collaboration are significant to discussions about the quality of needs assessments, particularly in the context of rapid onset, high impact hazards. Similarities exist between these findings, and evaluations of needs assessments carried out after the Indian Ocean tsunami; survivors of disaster often feel over-assessed, argue Mulligan and Nadarajah (2011) and De Ville de Goyet and Morinière (2006), and needs assessments are 'slow, overlapping, rarely coordinated, and poorly shared' (Telford and Cosgrave 2007: 4, 19). Poor coordination and collaboration characterising aid interventions in both tsunami events is perhaps indicative of the relationship between aid donors on a more general level, not merely during these events; prior to both tsunamis it had been repeatedly emphasised by stakeholders relevant to disaster aid interventions that agencies should make all efforts possible to ensure effective coordination (e.g. Sphere Project 2011, International Committee of the Red Cross 1997). Whereas stakeholders involved in disaster aid interventions had the rationale at the time of the Indian Ocean tsunami that such events were largely unknown to the wider public, the lessons this event produced appear to have been largely overlooked. The Solomon Islands' national disaster response was based on plans and acts dating back to 1987 and 1989, and the Provincial Disaster Councils (PDCs) (extension pieces of the NDC, which was partly responsible for coordinating the disaster interventions) were 'dormant and non-functional' (NDC 2007: 7, 10).

As a result of the uncoordinated, overlapping assessments Ghizo's survivors did not always fully grasp the differences in focus of aid donors' assessments. By arguing that 'affected populations are usually woefully under-informed about the intentions of the crowds of foreigners that are

suddenly in their midst', Christoplos' (2006: 25) work on the Indian Ocean tsunami illustrates that it is not unique to this particular situation in the Solomon Islands. Consequently, the overlapping needs assessments encouraged unrealistic expectations of aid: frequently survivors believed they would be provided with aid by all organisations carrying out assessments, and that each organisation would provide aid on most, if not all, areas assessed. How these misunderstandings shaped survivors' perceptions of disaster aid in the recovery phase is analysed in sub-section 6.4, which also analyses the second thematic area of survivors' frustration and disapproval with aid interventions, which is detailed in sub-section 6.3.2 below.

However, before moving on to sub-section 6.3.2, it must be stated that instant acknowledgement of and reflection on the problems of poor coordination and cooperation led aid donors to agree on a division of labour. By mid-May 2007, roughly one-and-a-half months after the earthquake and tsunami, the responsibility for all aid interventions was divided between three NGOs. Forming a short-term coalition was a decision driven by the NGOs' aims to achieve shared goals without duplicating efforts. Save the Children was previously working in Choiseul Province so they assumed responsibility for this province. World Vision was already present in the Western Province, and took responsibility for this area with the exception of Ghizo, its hardest hit island. Ghizo was primarily covered by Oxfam (UNOHCHR 2011). Other aid donors largely handed over materials to these three NGOs (for examples see UNICEF 2007a). Oxfam's work on Ghizo was split up in periods: the period from mid-May to August 2007 is referred to by Oxfam and research participants from the communities as 'phase 2' (as the preceding period in which Oxfam was one of many NGOs present on the islands was commonly known as the 'phase 1'), followed by the third period which lasted until late-2010. According to the Oxfam Solomon Islands' disaster management officer at the time of the events, the period from mid-May to August 2007 focused on early-recovery interventions such as water, sanitation and hygiene, whereas the focus of the last period was on longer-term activities, for example restoring income-generating livelihood activities. However, this reorganisation also implied another round of assessments as the prior

lack of cooperation between aid donors meant that additional data was needed.

6.3.2 Pre-existing power relations and aid donors' choices of personnel

A second thematic area of survivors' frustration and disapproval with the aid interventions was centred on pre-existing power relations, commonly exacerbated by the personnel employed by aid donors. As denoted in Chapter 3 and earlier in this chapter, pre-existing relations, inequalities and power politics can be of influence on the response and recovery of disaster-affected groups (Tan-Mullins et al. 2007, Amarasiri de Silva 2009, Christoplos 2006). Such issues, described by Foucault (1982) as complex power relations between individuals or groups, frequently promote the interests of some groups over those of other groups with less power or influence (Morrow 1999). In a disaster management setting this can imply differences in the access to and use of aid interventions aimed at recovery. This reinforces the point made in Chapter 3, namely that disasters are not natural (Birkmann 2006, Fothergill et al. 1999, Cannon 1994, Burton and White 1993).

Pre-existing power relations are often not grasped well by aid donors (e.g. Mulligan and Nadarajah 2011, Büsher and Vlassenroot 2010, Amarasiri de Silva 2009). As illustrated, this does not always cause problems during aid interventions aimed at stabilising the emergency situation as there is frequently plenty of humanitarian aid for all. Yet, if these issues are not taken into account in the assessment of needs and the subsequent distribution of aid aimed at recovery, the risk increases that pre-disaster tensions and problems will intensify (Amarasiri de Silva 2009, Christoplos 2006). This risk is particularly prevalent in ethnically diverse settings.

Before proceeding it must be emphasised that, as the sub-sections below will explain, issues related to power relations were predominantly brought up by participants in individual interviews rather than focus groups, especially when this concerned intra-group relations. The participatory activities used did not actively address power relations, and therefore did not 'construct

dichotomies of power and oppositional social grouping, which simplify highly complicated social relations' (Kothari 2001: 52). The risk that social inequalities are reified was therefore reduced to a minimum.

Three types of pre-existing power relations heavily influenced how aid interventions aimed at recovery were carried out in the eyes of survivors. The sub-sections below provide a picture of these power relations: ethnic discrimination (6.3.2.1), *wantoks* (6.3.2.2), and intra-community hierarchies (6.3.2.3). As will become clear, personnel employed by the aid agencies played a large role in how these power issues influenced the aid interventions; the choice of personnel is therefore discussed in sub-section 6.3.2.4. Section 6.4 analyses how the issues discussed in the four sub-sections shaped the survivors' perceptions of the aid interventions in a combined manner.

6.3.2.1 Ethnic discrimination

The first way in which power relations influenced aid interventions aimed at recovery is through power related to ethnic identity. Discrimination between Melanesian and Gilbertese Solomon Islanders living on Ghizo have shaped relations between the two groups since Gilbertese migrants arrived on Ghizo between the late-1950s and early-1970s (see Chapter 2), creating a discourse of disapproval of the Gilbertese presence amongst the Melanesian population. Predominantly negative views of Gilbertese Solomon Islanders were observed throughout fieldwork in Pailongge and Saegeraghi: in day-to-day situations as well as in the focus groups. Gilbertese survivors' lack of self-reliant skills to cope in the first days after the tsunami was at times ridiculed, and general remarks of a denigrating nature were made.

In focus groups and interviews the Gilbertese Solomon Islanders expressed they felt discriminated against. Examples they mentioned were that, based on their Gilbertese names, Gilbertese children are largely excluded from scholarships for higher education, and that Gilbertese villages

are not included in development programmes by the government. Regarding the latter, it was observed that governmental institutions as well as local NGOs at times carried out projects aimed at increasing communities' disaster preparedness in Melanesian villages, but not in Gilbertese villages. Asking villagers about this observation led to laughter and amusement in Pailongge, whereas in Nusa Baruka people confirmed this as an example of their exclusion from government programmes. This discrimination was neither confirmed nor denied in interviews with government officials. However, as discussed in Chapter 2, literature dating back to the period after the resettlement scheme ended, contributes to painting a picture of the tensions between the groups (e.g. Premdas 1984 and Knudson 1977).

Drawing on Lund's (1996) contribution to conflict studies, the pre-tsunami relations between the two ethnic groups could predominately be described as a situation of 'stable peace' bordering with 'unstable peace' (see Table 15). The relation between the Gilbertese communities was largely one of 'stable peace' but closer to 'durable peace' than their relations with Melanesian communities, and the relations between the two Melanesian communities were characterised by a high degree of 'durable peace'. Within each of the four communities relations were largely characterised by a situation of 'durable peace'.

Table 15 Peace and conflict: a five phase model based on Lund's (1996) 'curve of conflict'

Durable peace	Lasting peace, absence of self-defence measures, shared values, goals, and institutions, economic interdependence, communication, reciprocity, no hint of violence.
Stable peace	Higher in its degree of tension than that of durable peace and does not have the deep roots of durable peace, although relations are generally non-violent. Wary communication, limited cooperation, value or goal difference.
Unstable peace	Tensions continue to rise, disputes remain unsolved, suspicion between parties runs high but violence is absent or sporadic, parties view each other as opponents.
Crisis	Tensions continue to rise even further, tense confrontation, people are ready to fight, probability of outbreak of war is high.
War	Outbreak of violence, sustained fighting between parties.

Source: Author's compilation, adapted from the United States Institute of Peace (2008: 9) and Lund (1996).

6.3.2.2 Wantoks

The second way in which power relations influenced aid interventions aimed at recovery was through power related to the *wantok* system. In focus groups this was mainly expressed in the sense of *wantok* relations in other communities influencing how aid interventions in those communities took place, whereas in individual interviews it was at times commented on in relation to the interviewee's own community. As described in Chapter 2, the *wantok* system is a form of social capital safeguarding people belonging to the same *wantok* or language group. It acts as a safety net in a country where the state fails to foster the creation of such capital. Based on the principle of mutual reciprocity, *wantoks* should always help a fellow *wantok* in need. Depending on the needs, 'help' can take various forms, such as the provision of food, shelter or financial assistance. Political alliances are frequently based around the concept of *wantok* (Turnbull 2002), and having a *wantok* in a powerful position means that fellow *wantoks* can profit from this. Such a localised system based on social relations, language, and family ties operates very differently from systems adopted by aid donors. As will be discussed in section 6.4, a lack of understanding the *wantok* system, or a lack of taking it into account in assessing needs and distributing aid, can alter aid donors' actions in unanticipated ways.

6.3.2.3 Intra-community hierarchies

The third way in which power relations influenced aid interventions was through power related to intra-community hierarchies: relations of power based on positions held within communities. Similar to the *wantok* issue, intra community hierarchies were mainly commented on in individual interviews. As argued in Chapter 2, male community-leaders have more power and status than other community members, both in the Melanesian and the Gilbertese villages. In the former ethnic group these leaders are historically known as the 'Big Men', chosen on the basis of their socio-economic status, whereas in the latter they are a community's elders. Observations from the field indicate that in recent years church pastors also frequently hold decision-making positions in all four villages.

In focus groups and interviews in all four villages people expressed that hierarchical intra-community relations prior to the 2007 events were positive means to keep communities together and enforce norms and behaviours valued in the communities. It was commonly expressed that leaders used their power to enforce disciplinary sanctions for behaviours such as stealing, or children disrespecting adults. It reinforces Foucault (1977) argument that power is not just negative, but that it can also be a positive notion of social control as it contributes to shaping people's role as part of a community. The importance of the *maneaba* in the Gilbertese communities must be noted in this context, as this community house is more than a building - it is a 'court of justice' where miscreants are arraigned before the community and where elders decide their punishment (Sofield 2002).

In the weeks following the tsunami the Provincial Governments of the affected provinces ordered each affected village to set up a village disaster committee. These committees were predominantly composed by the communities themselves, and based on pre-disaster hierarchical relations. Hence, leaders or elders were frequently part of these committees. The committees were 'responsible for the receipt of all supplies given to the victims of every affected village and the fair distribution of these supplies' (NDC 2007: 10).

Before being able to discuss how ethnic discrimination, *wantoks*, and intra-community relations influenced aid interventions and led to survivors' frustration and disappointment with these interventions, the choices of personnel employed by aid donors must be detailed.

6.3.2.4 The choice of 'local' personnel

Increasingly international aid organisations attempt to build disaster aid interventions on local capacities, for example by temporarily employing local people (e.g. Berke and Campanella 2006) or by coordinating local NGOs (Fernando and Hilhorst 2006). This idea has gained popularity based on the argument that such an approach would be better adapted to the local context and

needs. However, such operations are not without challenges, especially when they concern interactions between people from different cultures that do not work together on an everyday basis (Trunick 2005). Cultural sensitivity is required, as well as considering whose knowledge influences the way aid interventions are carried out (Caddell and Yanacopulos 2006). In a culturally-plural country like the Solomon Islands (see Chapter 2) this means taking special notice of the intimate sub-societies and groups within the larger society. With regard to this, the employment of 'local' people was not an uncomplicated matter. Spokespersons from the NDMO and Oxfam Solomon Islands stated that in addition to employing a large number of people from the affected provinces, NGOs employed people from all over the country to assist in carrying out needs assessments and in distributing aid. Whilst some of these people were from the affected areas and worked in their own villages, others were from different ethnic groups or other *wantok* groups, from Gizo town instead of the rural areas, from other islands within the province, or even from other islands located in different areas of the country. Hence 'local' employees were not always local to the area or to the cultural context they worked in. As argued and explained in the following section, the choice of personnel, combined with the pre-existing power relations discussed in the above sub-sections, influenced aid interventions and led to survivors' frustration and disappointment with these interventions.

6.4 Perceptions of needs assessments and aid distribution

How cooperation and collaboration in assessing needs (sub-section 6.3.1), and pre-existing power relations and aid donors' choices of 'local' personnel (sub-section 6.3.2) influenced aid interventions according to the research participants, is evaluated in the following sub-sections. Sub-section 6.4.1 first analyses how the content discussed in 6.3.2 shaped survivors' perceptions of the way needs assessments were carried out and aid was distributed. Second, it investigates how unrealistic expectations of aid as a result of donors' limited cooperation and collaboration in assessing needs (6.3.1) affected survivors' perceptions of the aid interventions. Sub-section 6.4.2 analyses how the processes described in 6.4.1 influenced Ghizo's disaster-affected communities.

6.4.1 Who assesses and who is assessed, who distributes and who receives?

In in-depth interviews research participants from the researched villages voiced their frustration with discrimination, *wantoks*, and intra-community relations by raising these topics in relation to the way needs assessments and aid distribution were carried out by 'local' people employed by aid organisations. Expressing this frustration commonly started with a critique on the fact that Solomon Islanders were employed. It was frequently not understood why Solomon Islanders were the ones directly working with survivors, whilst expatriates took up coordinating roles, and *'sit lo offis, sit down lo table, give order* (sit in their offices, at their tables, giving orders)' (interview Arthur, Niu Manra, 11 March 2013). Frustrations regarding expatriate aid workers not working directly with the affected people were predominantly linked to the ways Solomon Islanders carried out their roles.

As explained in 6.3.2.4 people from across the Solomon Islands were employed to assist in carrying out needs assessments and aid distribution. This way of working intersected with pre-existing issues of discrimination, *wantoks*, and intra-community relations in ways likely not foreseen by expatriate aid donors. Emma from Niu Manra provided one of many similar accounts on how ethnic discrimination between Melanesian and Gilbertese Solomon Islanders manifested itself in the ways needs assessments were carried out in Gilbertese villages (11 March 2013):

> *Wanfella waitwomen kam, witem olketa twofella Solomon men. Him noa me sit down witem twofella. Solomon, ota black wan ia. Him no listen gud. Ota doim, but osem no barava interest blo olketa Gilbert pipol ia. Olketa just stori no moa. But olketa gud, but somehow osem... olketa no listenim barava... no kam stori gud and help lo olketa need blo Gilbert ia.*
>
> A white woman [expatriate] came with two male Solomon Islanders. With the two men I sat down. They were black Solomon Islanders [Melanesian]. They

> didn't listen well. They did the assessment, but it was like they were not really interested in us Gilbertese people. They just interviewed us, nothing more. They did well, but somehow it was like... they didn't listen really well... they didn't interview well and didn't help in meeting the needs of Gilbertese people.

Gilbertese villagers claimed that discrimination between Melanesian and Gilbertese Solomon Islanders not only influenced the ways in which needs assessments were carried out, but also resulted in unequal delivery of aid to the Gilbertese survivors. It should be noted that this research does not provide evidence on the actual extent of discrimination; it is the *perception* of discrimination that is the focus of this study given its importance in entrenching already existing views of other ethnic groups. Apart from interviews with Gilbertese survivors no other data indicated the presence of discrimination in these processes. As the issue was only brought up in one-on-one in-depth interviews carried out after recurrent periods of building rapport, it is not surprising that this issue is absent in evaluations of the aid intervention (e.g. Oxfam Australia 2007) carried out in a group-setting by a mix of expats and Melanesian Solomon Islanders. Adding additional support to the claim that ethnic discrimination may have occurred is the fact that it reflects the pre-tsunami issue of ethnic discrimination in everyday life on Ghizo; the argument that pre-existing issues of discrimination commonly influence disaster aid interventions, is commonly expressed in hazard and disaster literature (e.g. Amarasiri de Silva 2009, Fothergill and Peek 2004, Wisner et al. 2004). Whether the fact that aid organisations largely employed Melanesian Solomon Islanders is linked to ethnic discrimination is not known for the purpose of this research, but this belief again reinforced the perception of Gilbertese survivors that they were being discriminated against.

Mentioned not only amongst the Gilbertese Solomon Islanders, but also amongst their Melanesian neighbours, was that the *wantok* system affected the equality of aid interventions aimed at recovery. Joelle from Saegeraghi referred to this in the context of the incomplete

construction of houses (see Box 2 for a more detailed account of this example) (19 March 2013):

> *Solomon men him favour no more. 'Oh dis wan wantok blo me, so me buildim haus blo him'. Waitmen no more, no eni wantok so kam buildim fo really needim.*
>
> Solomon Islanders favour people: 'This is my *wantok*, so I'll build a house for him.' White men [expatriates] don't do this. They don't have any *wantoks*, so they build houses for those who really need them.

Box 2 Incomplete construction of houses

The 'incomplete construction of houses' was something mentioned in all focus groups. This is evidenced by the interview with Oxfam's Rex (25 March 2013): after assessments had identified how many houses were completely destroyed, partly destroyed, or had minor damage, some people (both Melanesian and Gilbertese) destroyed their own houses, so they would be entitled to new housing materials. When the amount of housing materials calculated on the basis of the assessments arrived, it was not enough to fix the higher number of destroyed houses. The materials were then distributed amongst all affected houses, resulting in people receiving less than they had anticipated. To the villagers at the receiving end it was not always clear why they received fewer materials. Another factor contributing to the 'incomplete construction of houses' was the shortage of timber. Oxfam tried to work mainly with timber from sustainable sources. This complicated getting timber quickly (interview Rex, Honiara, 25 March 2013). Additionally, communities' were expected to assist in timber procurement by sawing timber (IFRC 2008). Focus groups indicated this was not always appreciated by the communities themselves; therefore this labour was not carried out on a regular basis, contributing to the shortage of housing materials.

Like other survivors, Joelle viewed the *wantok* system as linked to in-country mechanisms of power, and expatriate aid workers were considered external to this system. Because of this many argued that when assessments and distribution were carried out unequally, it was likely the fault of Solomon Islanders. In all four villages, participants discussed the *wantok* system in the disaster management context predominately in relation to how it disadvantaged them: others (on other affected islands, in other villages on Ghizo, or within the villages) were said to have received more or better aid. Timber and iron roofing for houses were the most frequently mentioned examples.

However, as discussed in Chapter 3, there are also enabling factors of power (Foucault 1982), as being disadvantaged is relational. Although not commonly expressed, people also benefitted from the *wantok* system. One instance of this was observed in Saegeraghi. Here survivors stated that land on higher ground on which part of Saegeraghi's inhabitants settled after the 2007 hazards was allocated to them by a *wantok* working for the government.

Interviews with Solomon Islands-based NGOs involved in the aid interventions after the 2007 earthquake and tsunami confirmed that the *wantok* system had likely influenced aid interventions. Although this verifies that the *wantok* system played a role, it does not provide evidence on the exact extent of the power of *wantoks.* With an eye on the ethnic tensions in early-2002 (see Chapter 2), which were still fresh in the people's memory, it is again not the actual role these power relations played that is of importance, it is the survivors' *perception* of the roles *wantoks* played that matters.

Whilst Melanesian/Gilbertese discrimination and the *wantok* system were said to have influenced both needs assessments and aid distribution, survivors indicated that intra-community hierarchies influenced the distribution of aid more than needs assessment. Interviews indicated that needs assessments were mainly carried out on an individual or family level. Hence village disaster committee members, leaders or elders had little opportunity to influence this process. However, as explained previously, the distribution of aid was largely done via village disaster committees. In-depth interviews carried out in all four villages pointed to the misuse of power by committee members, leaders and elders (often part of the committees) in the process of distributing aid, and claimed this caused inequalities with regard to who received what. Charles from Saegeraghi explained (20 March 2013):

> *Assessment NGO hemi askim individual. Individual givim need. But taem evrithing hemi kam committee holdim. NGO givim evrisamthing to committee*

but him keepim for him seleva.

> The assessments done by the NGOs were directed at individual villagers. The individuals stated what they needed. But when the aid [based on the assessments] arrived, the village committee kept it. The NGOs gave all aid to the committee, and they kept it for themselves.

Similar to the issues of ethnic discrimination and the *wantok* system, intra-community hierarchical relations caused survivors to perceive that there were inequalities in who eventually received aid. Different from the former two issues was that the influence of 'local' employees in diverting or withholding aid was relatively small. The perceived source of wrongdoing was in this case not external, but internal to the affected communities. It signified a change in the intra-community power relations, which, up to that point, had largely been viewed as a positive force providing structure for the communities. However, the presence of materials that some could never have afforded in everyday situations, turned the positive connotations associated with the power relations into more negative ones. These findings advance the understanding of how pre-existing power relations are not only reproduced or intensified during disaster aid interventions (e.g. Amarasiri de Silva 2009, Fothergill and Peek 2004) in a rather linear manner, but can also radically change the connotations associated with these relations. It shows that the interactions between aid interventions and pre-existing power relations are more complex than previously thought. These findings also provide support for Méheux et al.'s (2007) argument that disaster-impacts must be addressed at community-level in order for crucial information not to be overlooked (see Chapter 3).

The NDMO acknowledged that these three pre-existing issues of power caused inequality in aid interventions and admitted that also on a governmental level, not only amongst NGOs, this influenced how aid interventions were carried out. A spokesperson of the NDMO stated that (26

March 2013): 'Sometimes the power structures in the community have some kind of influential [influence] in that [the distribution of aid]. (...) So we try to answer that issue'. He continued by explaining how the government addressed the issue of people missing out on aid by making extra funds available to members of the Solomon Islands' parliament:

> If you [those who missed out on aid] would be given some money from the members of parliament, that would have helped you... then you have some money. (...) The seven members of parliament of Western and Choiseul province have been given fifteen million Solomon dollars [approximately 1.3 million GBP] from the Solomon Islands' government. The initial idea was for them to go back and fill in the gaps, and support the people to quickly recover back. (...) There was no system in place to monitor how these funds have been used, no monitoring and evaluation. Maybe one or two [members] used the funds in the way they have been intended for, but I believe most of them have not distributed fairly among the people in the community...

Influenced by the way the administrative system was shaped, as well as the lack of accountability that members of parliament had (as discussed in Chapter 2), the attempt to address aid-related inequalities caused by power relations and the choice of employees only exacerbated the impact of aid being diverted or 'disappeared'. It contributed to speculations already present amongst survivors as to where aid had gone, who had taken it, and for what reasons. Both at inter- and intra-community levels survivors started to question one another's behaviour and intentions, and viewed each other with suspicion.

Adding to this mistrust were the unrealistic expectations of aid, based on uncoordinated and overlapping needs assessments (the first thematic area around which survivors' frustrations with aid interventions were centred, discussed in 6.3.1). As survivors expected more aid than they

were to receive, their expectations were not met. This is frequently observed in disaster-related aid interventions. Telford and Cosgrave (2006), for example, present similar findings in their evaluation of aid interventions after the Indian Ocean tsunami, and Davis (2012) reports that needs assessments carried out in an incompetent manner wrongfully raised survivors' expectations on housing reconstructions after the Haiti earthquake of early 2010. As survivors of the 2007 earthquake and tsunami did not realise their expectations were unrealistic, they perceived even more aid to have gone missing as a result of power relations. This strengthened survivors' frustration and dissatisfaction with aid donors' ways of working, as well as contributing to growing feelings of distrust, scepticism, and suspicion.

6.4.2 Conflict

As aid interventions continued, distrust, scepticism and suspicion continued to grow. Tensions paired with these feelings increased, eventually giving rise to conflict in all four communities in the second half of 2007. Conflict is here defined as disagreement between two or more members of a social entity which arises when the beliefs or actions of some of the members are seen as incompatible and resisted by the other members. Conflicts can be both violent and non-violent (Lund 1996). This section discusses how conflict arose in each of the four communities, and is followed by an analysis of why conflicts mainly occurred within communities, rather than between communities. It provides the basis for Chapter 7, which analyses how these conflicts influenced the affected communities' longer-term socio-cultural development with regard to indicators of community resilience

In Gilbertese Niu Manra aid disappearing from the village's storage house was the triggering event causing conflict. Tirza from Niu Manra explained (12 March 2013):

> *Storage house hemi barava nice because pipol takim same amount ia, no aniwan take extra. Wanfella pastor blo mifella distributim. Evri haus same*

kaikai. Big men too ia, everiwan same same. Him nice. No more big, no more smol. (...) Then tings hemi disappear! Pipol lo hea no more. Somefella out, like axe him out, canoes, staka canoes hemi kam, hemi disappear. Hem fight. First taem Niu Manra hemi split. Him other half ia, him other camp. Ota lo top, ota lo siteasea.

The storage house was very nice because everyone received the same amount. Nobody got anything extra. Our pastor distributed the aid. All houses got the same food. 'Big men' as well, everyone was the same. It was nice. We were all equal. (...) Then things started to disappear! People from here [Niu Manra] did that. Some things were taken, like axes, canoes, there were many canoes, disappeared. People fought over it. This is when Niu Manra split up. There is the other half, the other camp. Some live on top, some at the seaside.

The disappearance of aid caused conflict in Niu Manra. Although of a non-violent nature this conflict was so intense that it caused Niu Manra's villagers to split up in two so-called camps in late-2007: Niu Manra Top (NMT) and Niu Manra Site Sea (NMSS). Several families stayed on top of the steep hill where all had sought refuge, whilst others moved to the seaside. Each camp accused the other camp of stealing aid, a practice which would normally be heavily punished by the elders and leaders, but as these people holding power within the original community were divided amongst the two camps, the conflict between the two camps only intensified and communication between the two groups ceased completely.

In Nusa Baruka different camps were already established in the immediate aftermath of the tsunami. Based on the directions people ran in when the tsunami approached, the survivors had split into groups and stayed in five different locations including and around the location of the original village. These five locations became known as camps 1-5. The camps, instead of the

original community, became the organising principle for needs assessments and aid distribution. In each camp a village disaster committee was established to deal with the aid distribution. Mack, who stayed in camp 5, described what happened (18 March 2013):

> Conflict! Because the elders do this! They give the authority to camp leaders. But in my camp they doing bad things. In the other camps the leaders they are liars. They lie about their houses. Because NGOs come to straighten their house, and later they quickly destroy the house and pull it out, and they claim that the house is destroyed. And they receive it [a new house]. That is not good. (...) It is not really fair.

This provides a striking example of how aid donors' intentions to provide housing material to all affected people in a community in order to avoid disharmony (see section 6.1), resulted in exactly the opposite outcome. Throughout the delivery of aid hostility between the five camps increased, and they became increasingly polarised. Camps accused one another of taking aid, and feelings of jealousy increased when strategies as described by Mack were successfully used to acquire aid. Rather than referring to their village as a community, Nusa Baruka's inhabitants started to refer to camps as being five communities on their own.

Tensions also arose in the Melanesian villages. In Pailongge's focus group participants stated they were 'thinking of ourselves and forgot others', and that families 'struggled on their own' in the recovery processes. The amount of intra-community interaction and communication diminished, and tensions over aid escalated and turned into conflict. The impact diagram created in Pailongge's focus group listed 'community scattered', as a negative impact of the earthquake and tsunami (see Figure 41). The former Melanesian community split up into multiple groups mainly consisting of small units of family members.

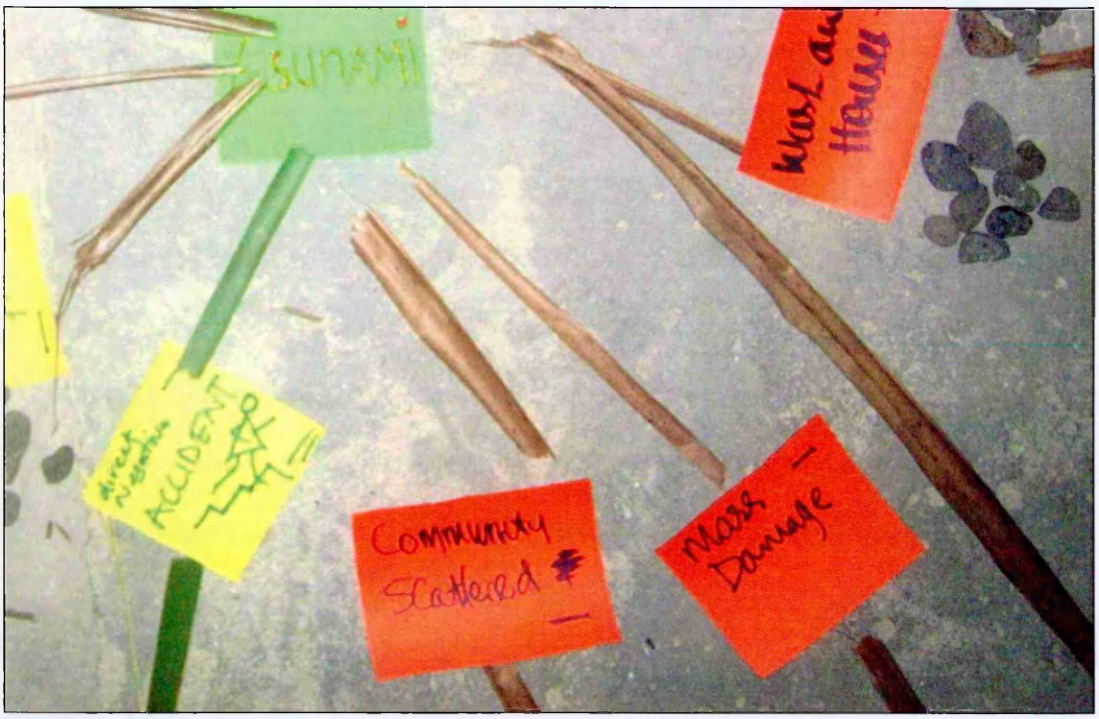


Figure 41 Section of the impact diagram created in Pailongge
'Community scattered' is identified as a primary negative impact of the tsunami.
Source: Focus group Pailongge, 16 May 2012

In Saegeraghi conflict was generated, despite the fact that all of Saegeraghi's villagers belonged to the same (extended) family (see Chapter 2). In in-depth interviews, research participants from Saegeraghi's original community claimed that the village disaster committee played a considerable role in the escalation of the situation by misusing their power for the allocation of resources. The conflict caused people to separate into two groups: a large group of people stayed on higher ground (the land known as Mile 6) where all had sought refuge after the tsunami, whereas a smaller number of people returned to the location of their pre-tsunami village (see Figure 42). Important lines of communication and interaction between community-members were cut off in this process.

Figure 42 Section of the impact diagram created in Saegeraghi
The card states 'separation from Saegeraghi' as a negative impact of the tsunami.
Source: Focus group Saegeraghi, 16 June 2012

Relations between Melanesian and Gilbertese Solomon Islanders slightly worsened during the aid interventions, according to focus group participants from Niu Manra and Nusa Baruka. They described it as an intensification of previously present power relations; there was nothing new about it, only the ways through which these power relations were expressed, changed. In contrast, and as discussed above, intra-community relations drastically changed as a result of aid interventions. Within all four villages a level of unstable peace was reached; tensions and suspicions between groups ran high, there was little mutual respect, and inter-group friendships were rarely present (Lund 1996). People who had previously considered themselves as part of the same community had ceased to communicate and interact with one another. Yet there were basically no incidences of physical violence against fellow villagers that this research could uncover; the conflict did not reach the extent of what Lund's (1996) scale of conflict calls 'crisis': tensed confrontations between armed groups. Driven by the aid coming in, the conflicts lasted until late-2010, when the aid interventions aimed at recovery ceased.

Within all four communities, the conflict was triggered by the abuse of existing power. This

emphasis on change in the nature of power furthers Gaski's (1984) findings that the nature and sources of the power possessed by one or several people may affect the presence and level of conflict within the larger social system to which the people belong. Coser (1957: 780) argues that such rather abrupt disturbances in the relative balance of a social system can lead to conditions in which people no longer do willingly what they have to do, and instead do willingly what they are not supposed to do (e.g. anti-social behaviour), making it obvious that conflict can result from such changes. When drawing on what Foucault (1982: 780) calls 'immediate struggles', it can also be argued that the likeliness of intra-community conflict occurring was larger than that of inter-community conflict occurring. Foucault argues that people most often criticize instances of power which are the closest to them; they look for the immediate enemy who directly exercises their actions on individuals, rather than the chief enemy. The intra-community conflicts can be classified in the first type of struggles identified by Foucault (1982) as discussed in Chapter 3. They are struggles against forms of social domination, manifested at the level of the whole social body (Foucault 1982: 795), in this case the whole community.

6.5 Conclusion

By investigating how ethnically diverse communities perceived disaster aid interventions, this chapter addressed sub-question B of the research questions: How did aid interventions influence communities' disaster management processes? It was explained that research participants viewed the arrival of aid as a transition to recovery and overcoming disaster, as the aid interventions focused on recovery and rebuilding lives for the vast majority of its duration. Hence, this chapter largely addressed aid intervention as part of this second phase of disaster management: recovery.

However, the chapter started off by focusing on aid interventions with a humanitarian character: aid aimed at stabilising the emergency situation rather than focusing on recovery. This type of aid was the first aid that reached survivors. By discussing the arrival of aid, it was illustrated that aid interventions are not considered part of a community's resilience as they are external to the daily

routine of a community. The influx of aid undermined the affected communities' needs to use endogenous means to weather disaster. It advances the understanding of the complexities of analysing communities' resilience to events faced when aid interventions are present. Additionally, this first part of the chapter provided support for Mulligan and Nadarajah's (2011) key argument that humanitarian aid interventions should be concerned with speed and efficiency, rather than focussing on a thorough consultation of communities' needs; due to the abundance, suitability and timely delivery of humanitarian aid, survivors on Ghizo regarded the influx of humanitarian aid as positive. It was also argued that, with plenty of humanitarian aid for all, the manifestations of pre-existing inter- and intra-group power relations were expressed to a smaller extent. At this stage of the aid interventions, this prompts a rethinking of Amarasiri de Silva's (2009) claim that pre-existing ethno-political relations intensify during aid interventions.

Nevertheless, as illustrated in section 6.3 of this chapter, power relations pre-dating the occurrence of the earthquake and tsunami on Ghizo eventually came to the fore as the focus on stabilising the emergency situation shifted to one of recovery. The way aid interventions aimed at recovery were structured, played a large role in the exacerbation of pre-existing power relations. Aid agencies employed people local to the Solomon Islands, but not always local to the exact location addressed by the aid interventions, which worsened inter-community pre-existing power relations related to ethnic discrimination and wantoks, and changed intra-community power dynamics. Survivors perceived aid interventions to be unequal, both within and between communities, perceptions that were further intensified by the unrealistic expectations of aid generated by uncoordinated and overlapping needs assessments. Feelings of distrust, scepticism and suspicion worsened, and eventually resulted in all four communities, Gilbertese and Melanesian, fragmenting. What this fragmentation implied for the make-up of the affected communities and how the affected communities viewed themselves in the years following the conflict, is discussed and analysed in the next chapter.

A physical separation of this extent was something none of the communities recalled experiencing before. These findings therefore suggest that conflict is more likely to arise in those instances where power relations become impaired rather than merely being reproduced. It provides more insight into the relation between the nature of aid interventions and the intensification of pre-existing power relations. This illustrates that aid interventions with a focus on recovery need to consider societal factors to a greater extent than aid interventions of a humanitarian character.

Undoubtedly, there were unique circumstances shaping how disaster aid interventions mixed with the local context. The wantok system, for example, is inherent to Melanesia. Nevertheless, many of the deficiencies of the aid intervention they relate to, have been noted in evaluations of rapid-onset hazards in other LDCs (e.g. Keraminiyage et al. 2008, Cosgrave 2007). However, as many of the evaluations on disaster aid interventions are carried out relatively shortly after the events , and are often primarily concerned with operational matters (Telford and Cosgrave 2007), they provide little opportunity for learning about the outcomes of these interventions or their legacies when it comes to longer-term socio-cultural processes. This chapter therefore provided a foundation for understanding how aid interventions can influence long-term socio-cultural developments, including changes in communities' characteristics that relate to those of resilient societies. The following chapter looks into how disaster aid interventions and the communities' responses to the earthquake and tsunami (as discussed in the previous chapter) influenced longer-term socio-cultural recovery and developments on Ghizo with regard to characteristics of resilient societies.

Chapter 7

Resilience and change: lessons and legacies

This chapter discusses and analyses how the processes of community response (Chapter 5) and the conflict brought about by the aid interventions (Chapter 6) influenced the affected communities' longer-term socio-cultural development with regard to changes in characteristics of community resilience. As this concerns the affected communities' processes of overcoming disaster and recreating an acceptable state of living, this chapter concerns their recovery. It therefore addresses sub-question C of the research questions: How did communities' responses and aid interventions influence long-term recovery? Similar to the preceding empirical chapters, this process is indicated in the table below.

Table 16 Longer-term recovery
This chapter addresses the second phase of disaster management, the communities' recovery or processes of overcoming disaster (indicated in grey).

Sub-question A	*Ch. 5*	RESPONSE	*How communities dealt with disaster*	Stage 1: initial reactions Stage 2: Coping mechanisms
Sub-question B	*Ch. 6*	RECOVERY	*How communities overcame disaster*	
Sub-question C	*Ch. 7*			

As explained in Chapter 1, this sub-question builds on the assumption that a disaster triggers short-term and/or long-term transformations or change (Torry et al. 1979), based on the argument that all experiences affecting a society contribute to evolutionary change. Processes of change, identified through research on Ghizo in 2012 and 2013 (five and six years after the earthquake and tsunami), were analysed with regard to the characteristics of resilient societies as outlined in Chapter 3, and specifically those addressed in the community profiles created in Nusa Baruka, Niu Manra, Saegeraghi, and Pailongge. In the following four sections changes in the affected communities' characteristics are analysed and their implications for resilience are

evaluated. The first three sections predominately relate to the analysis presented in Chapter 5, whereas section 7.4 primarily relates to Chapter 6. In section 7.5 the presented findings are examined in the light of the literature presented in Chapter 3. It is analyses what the findings imply, by relating them to the definition of resilience and characteristics of resilient societies. Section 7.6 presents the concluding remarks of this chapter.

It is important to bear in mind that the findings discussed in the following four sections are based on the definition of resilience as presented in Chapter 3: the capacity of a society to deal with and overcome the damage caused by the occurrence of natural hazards in order to obtain an acceptable and satisfactory standard of living, whether this implies a return to the pre-disaster social fabric or through accepting change. The changes in communities' characteristics that can be indicative of resilience as described in the next sections are therefore explicitly related to this definition of resilience. Chapter 3 illustrated that there are various ways resilience can be defined, such as viewing resilience as a component of vulnerability (e.g. Pelling 2003), or as the flip side of vulnerability (e.g. Folke et al. 2002). Hence, if other definitions had been used, slightly different processes might have been presented in the sections below, adding to and/or replacing the processes currently detailed. Section 7.5 further discusses this.

7.1 Knowledge

As evaluated in Chapter 5, differences in the Melanesian and Gilbertese survivors' reactions to the 2007 earthquake and tsunami were strongly influenced by the presence or absence of knowledge of what to do in the event of a strong earthquake and changes in the sea. The Melanesian population's resilience was influenced by the amalgamation of locally relevant knowledge from different spatial and temporal scales; it contributed to a timely and appropriate reaction limiting the disastrous impacts of the hazards faced. The lack of this knowledge amongst the Gilbertese villagers caused them to be less resilient than their Melanesian counterparts.

As described in Chapter 3, Beck (1992), Copp (2004), Schatzki et al. (2001), and Seyfang et al. (2010) emphasize that first-hand experiences of hazards influence one's attitude towards these hazards, and influence the knowledge used in living and dealing with such events. Disaster-affected populations are not merely dependent, inferior and subordinate to disaster (Bankoff 2001), but are able to learn from the experience of a disaster (Wisner et al. 2004). Comprehending the importance of their locally relevant knowledge in generating appropriate reactions to hazards, and therefore limiting their disastrous impacts, the Melanesian survivors placed more emphasis on passing on such knowledge to younger generations (see Figure 43).

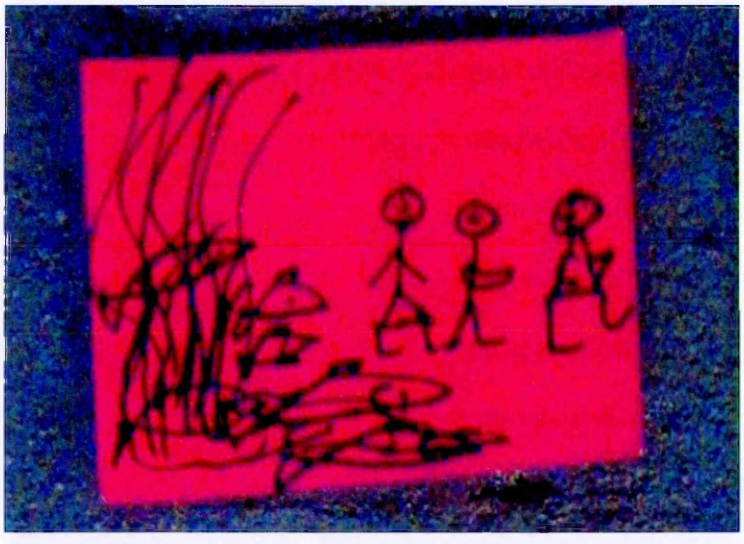


Figure 43 Drawing made by children from Pailongge
The drawing illustrates people running away from the approaching tsunami wave.
Source: Focus group Pailongge, 17 May 2012

Illustrating the value of this shift in behaviour is Tilda's story. Originally from Temotu Province in the eastern part of the Solomon Islands, Tilda had moved to Ghizo prior to the 2007 events. She had no knowledge of tsunamigenic earthquakes before experiencing the 2007 tsunami. Not knowing how the earthquake and tsunami were caused and if, or where, such events might occur next, she feared that she or her family might be affected by such events in the future. She started sharing her experiences and lessons learned, and bought a solar charger for mobile-phones which she gave to her family in the eastern part of the country when visiting them for Christmas 2012. As her story illustrates, this small piece of technology empowered several people of a community on the other side of the country. Tilda: (22 March 2013):

Me say: "Taem anything hemi happen, ground hemi shaki, iu takim solar, go lo on top lo bush". Brother blo me hemi say: "No, u keepim". "No", me say, "iu takim". That wan lo January. Number 6 lo February: tsunami kasim. So, brother blo me takim charger and fone on top lo bush and call fo help. Brother blo me ringim me lo phone. Him say: "Thank iu fo advice". After tsunami kam sixfella men lo Temotu ringim me: "Thank iu fo advice". Me happi tumas, haaaaaappi tumas.

I said: "If anything happens, if the ground shakes, take the solar charger, go to higher ground." My brother said: "No, you should keep it". "No", I said, "take it". That was in January [2013]. At 6 February [2013] a tsunami hit [the eastern part of the Solomon Islands].[48] So my brother took the charger and phone to higher ground and called for help. [Later] my brother called me on my phone. "Thank you for your advice", he said. After the tsunami six men from Temotu called me to thank me for my advice. I am very happy, very happy.

The Gilbertese survivors, having experienced the negative consequences of the absence of locally relevant knowledge at the time of the 2007 hazards, started to pass on lessons learned and knowledge gained from experiencing the earthquake and tsunami (see Figure 44). Arthur from Niu Manra explained the practice of sharing knowledge of the disaster experienced (11 March 2013):

This taem mifella makim stori for pikinini. Otherwise in future bai him kam, no save. (...) Makim stori lo church, lo haus, lo olketa individual pikinini... things bai him kam: 'wan dae bai him iu meetim'. In future bai him meetim.

[48] This tsunami was produced by a shallow earthquake with a magnitude of 8.0 (AngliCORD 2013).

> Nowadays we tell the children [about the hazards]. Otherwise when they [the hazards] happen in the future, they [the children] don't know. (...) We tell stories in church, at home, or to individual children... [about] things that will come: 'one day you will encounter them'. In the future they will encounter them.

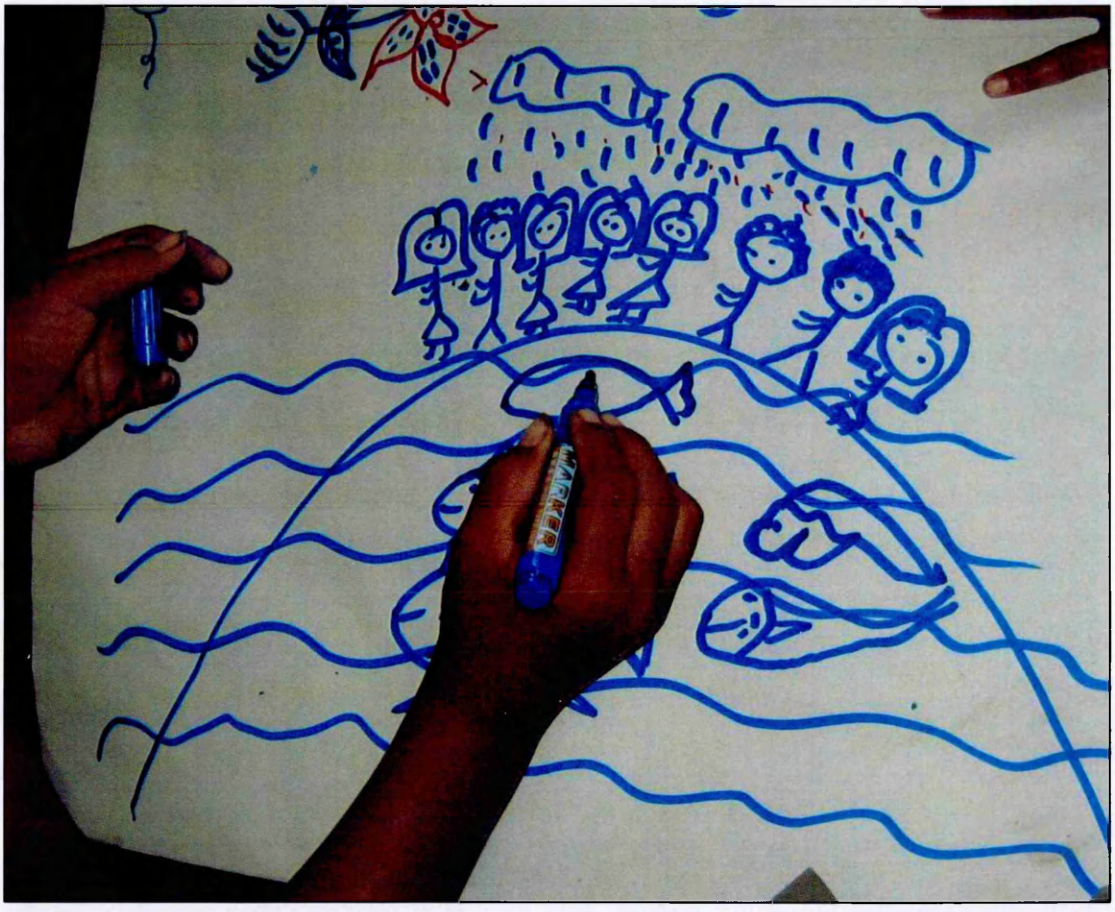


Figure 44 Drawing made by children in Nusa Baruka, illustrating the need to get to higher ground when a tsunami approaches
Source: Focus group Nusa Baruka, 4 May 2012

As argued in Chapter 3, bringing different kinds of locally relevant knowledge together, and learning from experience and direct observations are often characteristic of disaster-resilient communities. For both the Melanesian and Gilbertese survivors, the 2007 events increased their overall risk perception. Shaped by the recentness, magnitude and intensity of personal experiences, it prompted the affected Melanesian communities to pass on the amalgamation of locally relevant knowledge already present, and both the Melanesian and Gilbertese ethnic

groups to pass on the knowledge gained from these recent experiences. Tilda's story is a remarkable example of how this can positively influence resilience in a wider context; at the onset of the 2013 Solomon Islands tsunami her family was better equipped to face disaster. Learning from experience and passing on such knowledge enhances the capacity to deal with the initial impacts of future hazards of a similar nature. It is therefore an indicator of strengthened resilience of the affected communities, and, as Tilda's story illustrates, those close to them.

7.2 Relocation to higher ground

Most survivors from Nusa Baruka, Niu Manra, Saegeraghi, and Pailongge expressed they were lucky that the tsunami hit during daylight hours and not at night; without light the escape to higher ground would have been much more difficult, and the loss of life likely much higher. The realisation that a tsunami can hit at any time, in combination with the rapid-onset nature of the hazard, made people afraid to inhabit the coastal areas again. The majority of Gilbertese and Melanesian survivors settled on higher ground where they had initially sought refuge (see Figure 45 and Figure 46). This was done to decrease their susceptibility to the impacts of hazards; it does not mean that they are therefore better equipped to deal with disastrous impacts of hazards. As illustrated by how resilience and vulnerability have been defined, this is therefore more related to reducing vulnerability, rather than to increasing resilience. Nevertheless, it could be argued that having the knowledge that higher ground might be a safer place to live in a country prone to tsunamis, is more characteristic of resilience than of vulnerability as it can shape people's capacity to react to such hazards.

Figure 45 Settlement on higher ground in Niu Manra (NMT) (2012)

Figure 46 Children in Nusa Baruka pretending to go fishing in their 'canoe' at their house on higher ground (2012)

Although almost all survivors moved to higher ground after the tsunami, over the course of the research it was observed that people gradually started to move back to the coast. Research participants mentioned various reasons for this, a main one being the issues of water and sanitation. Prior to the tsunami most inhabitants of the four villages lived in low-lying coastal areas. They had access to fresh water from the pipelines that were present in these areas. Those living in the low-lying hills made the short walk down to collect water or collected it from springs or rainwater-harvesting facilities near their houses. Although proper sanitation was frequently absent this was not seen as much of a problem: people in the lower areas relied on piped water and did not mind the contamination of the water-streams by people in the hills. However, as the tsunami destroyed most pipelines and the majority of people moved to various areas on higher ground, the contamination of streams became a more pressing issue (see Figure 47 and Figure 48). These issues related to relocation were not adequately addressed in policies for recovery planning; at the time of research access to clean water was still a problematic issue in both Melanesian and Gilbertese villages.

Figure 47 Inset of impact diagram produced in Niu Manra
Stones placed on the entry 'water problem', as an impact of the tsunami, prioritise this as a need for recovery.
Source: Focus group Niu Manra (NMT), 9 June 2012

Figure 48 Children in Niu Manra (NMT) drinking water from a drum used for rainwater harvesting
This picture was taken in the final weeks of the wet season in March 2013. In the wet season the issue of water is not as pressing as it is in the dry season, as buckets and drums placed outside quickly fill up with rainwater.

Another factor complicating settlement on higher ground, particularly for the Gilbertese, was the move away from the location of their ocean-based livelihood activities. In the absence of proper infrastructure fish and other products from the ocean needed to be carried uphill, which is a time- and energy-consuming practice. Canoes could not be carried uphill, and therefore had to be left at the seaside without being looked after. In line with Shaw's (2010) research on communities affected by the Indian Ocean tsunami, issues around the security of property arose: canoes were stolen, damaged, or disappeared temporarily. Particularly in Nusa Baruka this was seen as a problem, as canoes were the main means of transport to Gizo town and its market. Transportation and access to the market were also put forward as constraints to living uphill in the other villages. From the higher grounds of Niu Manra the walk down to the road that leads to Gizo takes approximately forty minutes. From Mile 6, the uphill area where people from Saegeraghi settled after the 2007 events, this can take up to sixty minutes.

The issues around water and sanitation, security of canoes, and access to Gizo town market, along with coastal living being part of both ethnic groups' cultural identity were pull-factors to move

back down. Additionally, water pipelines slowly started to be restored in the coastal areas, which meant that access to clean water became less of an issue when living at the seaside. Also, as illustrated by other case studies on longer-term recovery (e.g. Bang 2008, Bell 1991), the concern with disaster risk generally fades over time. As Davies (2004) observed after the 1998 Aitape tsunami in Papua New Guinea, the relocation to higher ground seemed at times to be temporary. The trend of moving back to the coast appeared to be strongest in the villages in which focus group participants indicated that they were less open to cultural change as a way of increasing their resilience (see Table 17). In the Gilbertese villages the trend to move back down was strongest in Nusa Baruka, which has few mixed-marriage families in comparison to Niu Manra.[49] Participants stated that their desire to 'maintain our culture [of fishing]'played a prominent role in this.

Table 17 Openness to change
Results of discussions on whether villagers were open to cultural change if this would increase their resilience to disasters. These discussions were part of the creation of community profiles as discussed in Chapter 4.

Village	Open to change?	Patterns of relocation As observed between March 2011 (first visit to the field) and March 2013 (last visit to the field)
Pailongge	Half-half	A few people moved back
Saegeraghi	Yes	None observed
Nusa Baruka	No[50]	Several people moved back down (more than Pailongge)
Niu Manra	Yes	None observed[51]

Source: focus groups Pailongge (14 May 2012), Saegeraghi (16 June 2012), Nusa Baruka (4 May 2012), and Niu Manra (2 June 2012) and author's observations.

[49] As discussed in Chapter 2 and 5, the Gilbertese Solomon Islanders traditionally have a strong reliance on the ocean, whereas the Melanesians have a strong reliance on gardening which is commonly carried out on higher ground. The low number of Melanesian inhabitants in Nusa Baruka implied that they had maintained a stronger sole reliance on ocean-based livelihood activities than the Gilbertese in Niu Manra, where several mixed families also partly relied on gardening.

[50] Despite the community profile suggesting that Nusa Baruka's villagers are not open to change, participant observation (and questions asked about the observations) indicated that the practice of gardening had been adopted after the 2007 hazards (see section 7.3), which is indicative of change.

[51] 'Openness to change' is not the only reason why the villagers of Niu Manra who settled on higher ground did not move down. Another reason is discussed in section 7.4.

However, despite the observed trend of moving back to the seaside, and despite the move to higher ground being more an issue of reducing vulnerability rather than one of increasing resilience, moving to the hills brought about changes in the Gilbertese villages which can be seen as characteristics of a resilient society (see Chapter 3), and therefore of increased resilience. The following section evaluates these changes.

7.3 Livelihood diversification

As explained in Chapter 5, differences in Melanesian and Gilbertese survivors' means of coping with the immediate aftermath of the earthquake and tsunami were deeply shaped by the strength of the diversification of their livelihoods, and confirmed Gaillard et al.'s (2009) argument that the strength of diversification of livelihoods can be seen in the presence of livelihoods outside vulnerable areas. Struggling for survival and not being able to cope in a self-reliant manner prompted the awareness amongst the Gilbertese that their pre-disaster livelihoods were ill-equipped to deal with the disastrous consequences of some of the hazards occurring in the Solomon Islands.

Gaillard (2007) argues that developing societies frequently turn to changes in their way of life to respond to and recover from the disastrous impacts of natural hazards (see Chapter 3), and that the parts of societies most likely to make such changes are those relying on a single livelihood. This argument is confirmed by the research carried out on Ghizo. Realising that the absence of gardens and knowledge of wild foods negatively influenced their ability to cope with the consequences of earthquake and tsunami, the Gilbertese survivors developed an interest in incorporating these means of food provision into their everyday lives. The move to higher ground facilitated easy access to land, and throughout the first years of rebuilding lives and livelihoods the Gilbertese survivors started to adopt the practice of gardening on the hills (see Figure 49). Kbareti from Niu Manra (NMT) commented on this change (31 May 2012):

After tsunami mifella makim gaden. Husband blo me save. Him save bifor. Me no save who noa teachim him, him save no moa. Also Solomon wives hemi save. Kaikai blo garden hemi nice! Bifor only kaikaim fish and kaikai lo shop. Now mifella garem gaden!

After the tsunami we started to make a garden. My husband knows how to do so. He already knew before the tsunami. I don't know who taught him, he just knows. Also [my sons'] Solomon [Melanesian] wives know. The food from the garden is nice! Before we only ate fish and food from the shop. Now we have a garden!

Figure 49 Hillside garden in Nusa Baruka
Gilbertese woman with child walking to her Gilbertese neighbour's garden. The garden displays a variety of crops amongst which are the cassava plants seen on the hillside.

Like Kbareti, several people from Niu Manra stated that the skills to make and maintain gardens were taught to them by Melanesian Solomon Islanders who married into their families. Other

inhabitants from Niu Manra, as well as most people in Nusa Baruka argued that they had learned such skills by being educated in the Solomon Islands, but that they had not practiced gardening on a large scale prior to the 2007 earthquake and tsunami as it was not part of their culture. The fact that the Gilbertese survivors adopted gardening does not mean they moved away from predominately ocean-based livelihoods. The latter continued to be used as direct means of food provision, as well as being the principle source of income generation. People started gardening to enhance food-security; its produce is for personal use only, and it is not sold at the market. Gilbertese gardens are commonly not as large in size as those of Melanesian Solomon Islanders and generally display a smaller variety of crops. Although some people moved back to the seaside, their gardens on higher ground are usually maintained. However, similar to canoes being stolen when not living at the seaside, by not living in the immediate proximity of the gardens, the risk increases that crops are stolen.

In addition to taking up gardening, the Gilbertese survivors started including wild edible plants provided by the tropical terrestrial ecosystem into their diets. They learned that these fruits and vegetables cover the whole island, and that the chances that all of these wild foods would be destroyed or made inaccessible by a hazard are relatively small. Arthur from Niu Manra explained (11 March 2013):

> *So this time mifella train for usim olketa things... kai kai lo site lo bush: olketa leaf, vegetables. Mifella takim lellebit culture blo olketa Solomon.*
>
> This time we try to use such things... food from the bush: some leaves, vegetables. We adopt a bit of the culture of the [Melanesian] Solomon Islanders.

Motu cooking as practiced by Melanesian Solomon Islanders was also adopted by Ghizo's Gilbertese islanders. Particularly in the immediate aftermath of the 2007 hazards the interest in *motu* cooking increased tremendously. Gilbertese villagers stated they now know how to *motu*, although it appeared not to be practiced on the same scale as the Melanesian Solomon Islanders do.

For the Melanesian survivors the re-emphasis of practices and patterns in response to the 1997 El Niño episode made them better equipped to deal with the disastrous consequences of the 2007 earthquake and tsunami. As described in chapter 5, Wenger (1978) lists three factors that determine the development of a disaster subculture, A) the repetitive impact, B) the time gap between signs of the hazard and the impact of the disaster, and C) the level of damage or impact. The level of impact of the 1997 El Niño episode contributed to the Melanesian Solomon Islanders re-emphasising particular livelihood practices, such as relying on wild edible plants. The fact that they were consequently relatively well-equipped to cope with the immediate aftermath of the 2007 hazards emphasised the importance and value of their existing livelihood strategies in dealing with disaster. Thus being able to cope with the repetitive impact of hazards (factor A as listed by Wenger), led them to adapt livelihood strategies only to a minimal extent, apart from the fact that gardens at times moved further inland as people migrated away from the coast. However, they did stimulate the maintenance and enhancement of these practices (e.g. by informing children of the importance of these strategies in times of disaster).

Similar to how the impact of El Niño had served as a stimulant for the continuous development of a disaster subculture amongst the Melanesian Solomon Islanders, the level of impact of the 2007 earthquake and tsunami triggered the development of a locally relevant disaster subculture amongst Gilbertese survivors. Like their Melanesian neighbours, the Gilbertese adopted several food-producing activities spread out over various locations, increasing the strength and diversity of their livelihoods, enhancing access to livelihoods, and hence distributing the risk of disaster.

This makes them better equipped to deal with and overcome disastrous consequences of future hazards, thus increasing their resilience (Bahadur et al. 2010, Gaillard et al. 2009, Twigg 2007).

7.4 Community feeling

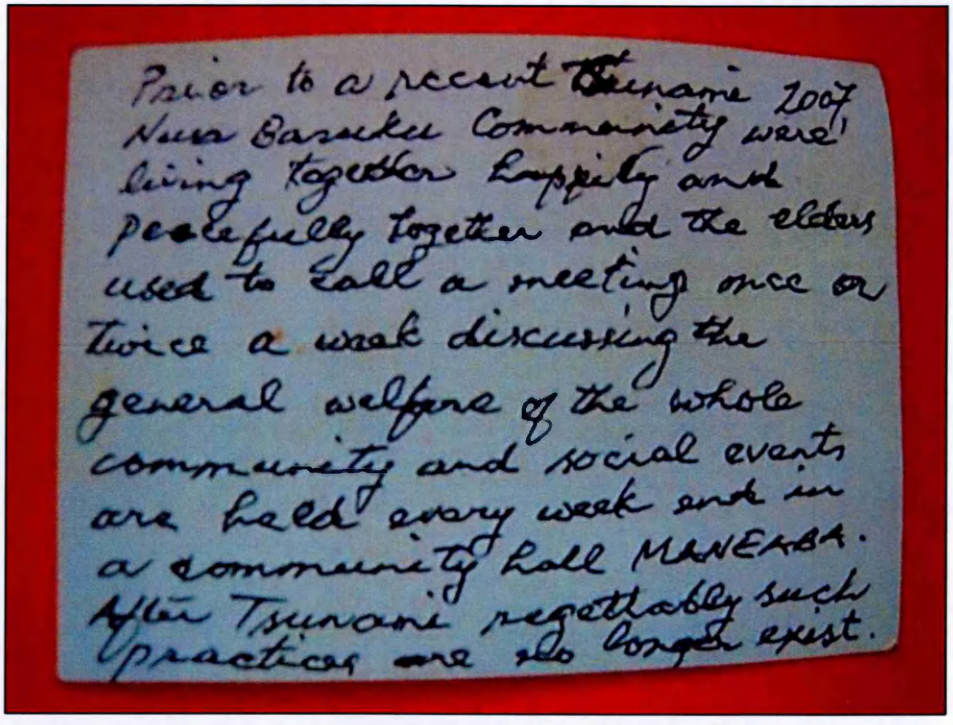
As analysed in Chapter 6, the aid interventions aimed at the re-establishment of basic services, infrastructure and activities gave rise to feelings of distrust, scepticism, and suspicion centred on issues of power related to ethnic discrimination, *wantoks*, and intra-community hierarchies. Against this background, changes in the pre-existing intra-community power dynamics led to the rise of conflict in all four villages. Nusa Baruka split up in five camps, Niu Manra and Saegeraghi divided into uphill and downhill communities, and Pailongge's villagers spread out in the hills close to their original village. At the time of research (2011, 2012, and 2013) inhabitants of all four villages stated that conflict had abated as there was no more aid coming in, but that people still lived separated and scattered.

It is important to understand conflict in this context, as it can have negative implications for community feeling. As listed in Table 5 in Chapter 3, community cohesion is characteristic of resilient societies. Conflict can lead to a decline in the ties within a community and can therefore have negative implications for community resilience. The next four sub-sections discuss community ties in each of the four research locations in the post-conflict era, followed by a fifth sub-section analysing the implications for community resilience. Many of the findings touch on the notion of community cohesion. This term was either directly used by research participants or referred to indirectly by alluding to its elements. By introducing the notion of 'community' in Chapter 3, it was explained that community cohesion refers to a group-feeling based on a shared history, a notion of identity, set (cultural) values and norms, similar position in society, means of livelihood, sharing resources, looking after and standing up for each other, equal rights and opportunities, and linked social ties of trust, care, and control.

7.4.1 Nusa Baruka

In 2013 Nusa Baruka's villagers still lived in five camps that they regard as different communities. A situation of stable peace predominately characterises the interactions between the people: there is wary communication and limited interaction and cooperation between people (Lund 1996). The situation borders one of unstable peace where tensions such as suspicion and lack of trust are present (Lund 1996) (see Table 15 in Chapter 6). There was no public hostility towards members of other camps, but in group conversations within a camp, other camps were often seen in a negative light and accusations were made. It was unanimously stated that community cohesion within the village decreased after the tsunami. Mack from camp 1 illustrated this by bringing up the notion of 'community' (8 April 2011): 'You white people always speak of 'community'. But what is a community? We are no longer a community. We are divided.'

The location of the original village was known as camp 1, whereas camps 2, 3, 4, and 5 were situated further inland, on the hills. Camp 1 is home to several resources that were shared within Nusa Baruka when all villagers lived there, for example a water tank and the volleyball-net. These resources are now only used by members of camp 1. This camp is also home to the original *maneaba*, the Gilbertese community house where elders traditionally build and maintain Gilbertese culture and guide and lead the community as a whole (see Chapter 2). However, as inhabitants of the original Nusa Baruka no longer consider themselves a community, and are scattered far and wide, the *maneaba* fails to serve its purpose. It is no longer a point where people come together, or the place where elders uphold the traditions and cultural norms considered essential to maintain community values and accepted behaviour (Sofield 2002) (see Figure 50). Since the tsunami, the *maneaba* is mainly used by people from camp 1 to organise parties on weekend evenings. In terms of Gilbertese cultural practices, these parties have little value. They are characterised by dancing and loud popular music, and are attended particularly by teenagers. In all camps adults complained about the consumption of alcohol and marijuana at these parties.



'Prior to a recent tsunami 2007 Nusa Baruku community were living together happily and peacefully together and the elders used to call a meeting once or twice a week discussing the general welfare of the whole community and social events are [were] held every weekend in a community hall *maneaba*. After tsunami regrettably such practices no longer exist.'

Figure 50 Text on notecard by one of Nusa Baruka's elders, written during the focus group (5 April 2012)

The behaviour of camp 1's teenagers and the parties organised there are heavily criticised by inhabitants of other camps, particularly those of camp 3, which is situated on a high hill overlooking camp 1. The six families living in camp 3 constructed a building which serves as their own *maneaba* as well as a church. The building was funded by the Australian United Church; the majority of people living in camp 3 belong to the United Church denomination. This is not coincidental: on the morning of 2 April 2007, Nusa Baruka's United Church followers were on their way to attend Mass as it was Holy Week. When the tsunami hit the village these people ran in one direction and settled on the same grassy hill. This relatively small area became known as camp 3.[52] In addition to religious purposes, camp 3's inhabitants use their church to transfer Gilbertese

[52] In comparison to the other camps, camp 3 comprises a small area. The families in this camp live in close proximity of one another.

cultural norms and values, and to guide and control their community, as previously done in the *maneaba*. Every evening a bell is rung to announce prayer time, after which people can come together in the building. The minister of camp 3's United Church stated these meetings are organised to keep people together, and to prevent them from going down to the parties in camp 1. Children generally kept quiet during such meetings and did what they were asked to. They respected decisions pronounced in the church, like decisions traditionally pronounced in a *maneaba* had to be respected (Sofield 2002). In addition to the building serving as a *maneaba* and church, another difference with Camp 1 was Camp 3's joint-labour initiatives. These were initiated to help people in this camp make gardens, and to keep the area within the camp clean.

Camp 2, 4, and 5 did not have a *maneaba*, church, or other place where their camp-members gathered. Many of the inhabitants of these camps are Catholic, but other religious denominations were also present. As in camp 1, where most people are Catholic, people either prayed in their own homes or at times went to Gizo town to attend church.

In summary it can be argued that community cohesion heavily decreased in the original Nusa Baruka. This process was triggered by the conflict over aid, causing members of the original community to separate throughout recovery. Consequently, this weakened the function of the *maneaba*, which implied a decline in the preservation and passing on of traditional cultural values, of which community cohesion was an important part. In those camps where a church as another form of a community house was present, the shift in cultural practices was not as strong, and the feeling of community cohesion was more present. However, this cohesion does not relate to the original community as a whole, but to relations within the newly formed sub-groups.

7.4.2 Niu Manra

During the last period of fieldwork in spring 2013 Niu Manra's villagers still lived strongly separated in the two groups that arose as a result of the conflict over aid. These are now

considered two different parts of the original village: NMSS and NMT. The latter is approximately 45 minutes by foot removed from NMSS (see Figure 51), and each have their own village-leaders. Unlike in Nusa Baruka where some people moved back to the original location of the village and therefore to camp 1, villagers in NMT stated they cannot move down because the area at the seaside is NMSS' territory. The understanding between the two Niu Manras is one of unstable peace: tension and suspicion run high but violence is usually absent. Inhabitants from each of the Niu Manras speak of the other Niu Manra with anger, and refrain from communicating and cooperating with one another.[53] It was universally stated that community cohesion and equality decreased between villagers of the original Niu Manra.

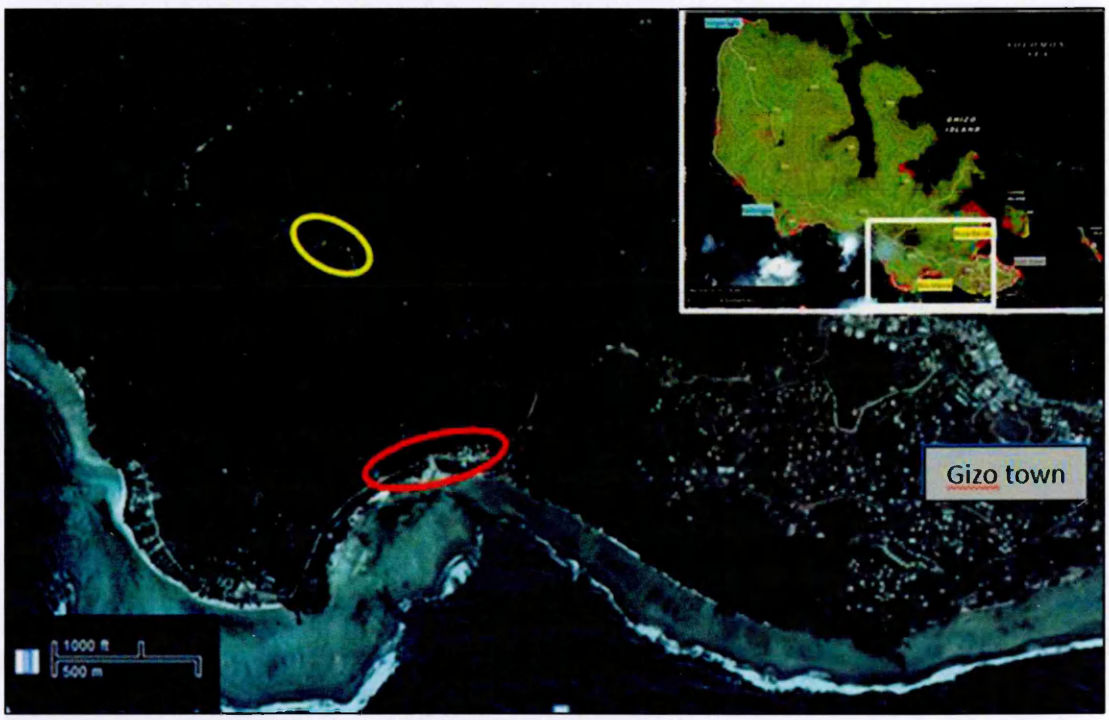


Figure 51 Location of NMSS (red oval) and NMT (yellow oval)
The inset shows the area of Ghizo Island presented by this Figure.
Source: adapted from: Google maps (2013) and UNITAR/UNOSAT (2007).

The *maneaba* in the original village of Niu Manra was destroyed by the tsunami. Several elders, who took decisions and implement the power of the *maneaba*, died during or shortly after the tsunami. Without this leadership the cohesion within the community weakened almost

[53] For this reason the focus group in Niu Manra was split up between NMT and NMSS. Participants from both Niu Manra's were welcome to attend each of the focus groups, but, with the exception of one person, people only attended the focus group in their Niu Manra.

immediately following the tsunami. The conflict over aid exacerbated this process. Patrick, from NMT, illustrated how he thinks the loss of the *maneaba* resulted in the neglect of previous cultural practices and values, and the decline in the regularity and consistency with which people came together (9 June 2012):

> At the time [before the tsunami] the elders ruled everyone to come to a meeting like this [the focus group]. They would be ordered to do so by the elders and would be punished if they didn't. Now there is a lack of control.

The lack of control Patrick refers to relates to the increase in alcohol consumption and careless attitudes mentioned in similar lines of reasoning in the focus groups (see Figure 52). This was said to be related to the fact that the only land on Ghizo that Gilbertese people from Niu Manra could call their own, was destroyed by the tsunami and was therefore perceived as not safe to live on. 'What is the point of building on and investing in such land?', focus group participants argued. According to the participants, careless behaviour, drinking and slack attitudes increased as a result of the perceived loss of their land's value, behaviour that would have been punished by the rules of the *maneaba* in the past.

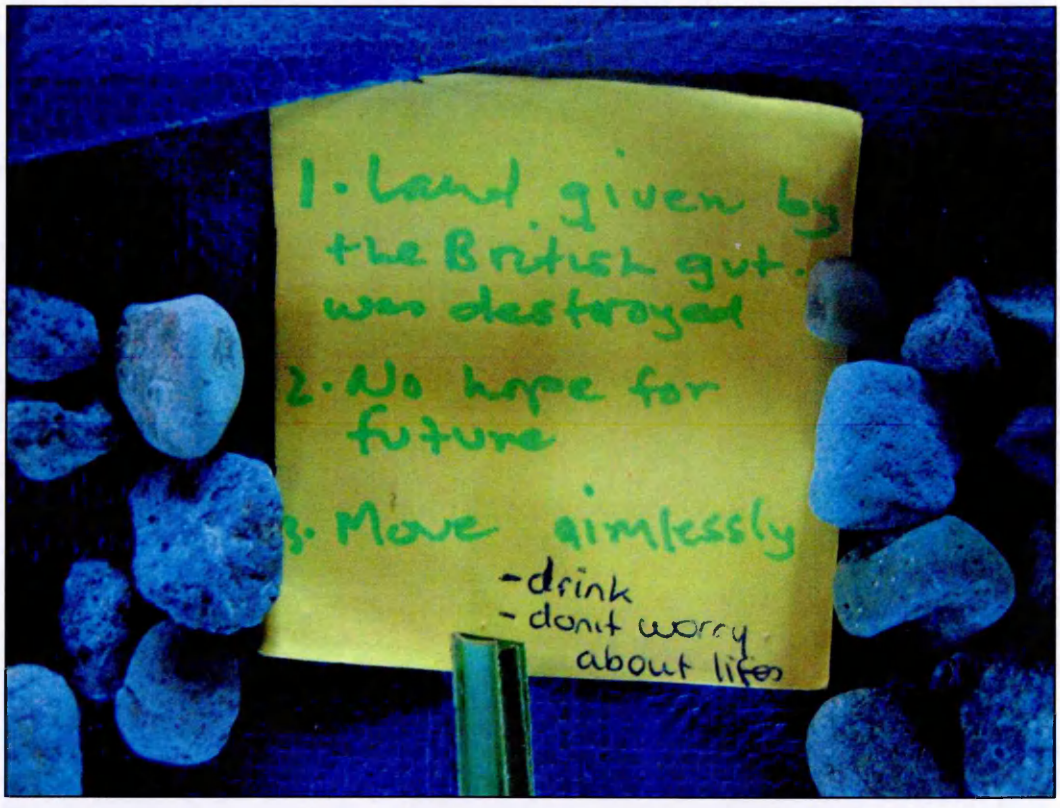


Figure 52 Note card part of the men's input to the impact diagram made in Niu Manra
The note-card states: '1. Land given by the British government was destroyed, 2. No hope for future, 3. Move aimlessly- drink, don't worry about lives.'
Source: Focus group Niu Manra, 9 June 2012

After the split both Niu Manras built their own *maneabas*, a process that negatively affected the original community's cohesion. Each *maneaba* provides some structure and guidance for each respective village, but both fail to create a level of community cohesion in each of their new villages as there had been in their original village. The original Niu Manra struggled with the reduction in the number of elders after the tsunami, and as the population split in two, so did the number of people that could take over the elders' roles. Another factor influencing the weakening of community cohesion was that the population of each of the Niu Manra's had spread out. Due to availability and rights to land some villagers of NMSS live closer to MNT and vice versa. These people are disinclined to attend meetings in 'their' *maneaba* because of the distance, but do not attend meetings in the 'other' *maneaba* either.

Similar to the renewed role of the United Church in Nusa Baruka's camp 3, the role of the church changed in parts of the Niu Manras after the tsunami, and partly filled the vacuum left by the

reduction in the power related to the *maneaba*. There are many churches in the Niu Manras as people belong to various religious denominations. Additionally, as people separated, geographically and socially, various churches (or buildings that serve as churches) of a denomination were built across the area. These were commonly constructed by small groups, mainly clusters of families, because the distance to another church of their denomination was considered too large. Particularly in those areas without easy access to a *maneaba* and where people built their own churches, the transmission of Gilbertese cultural values in church increased. Arthur is part of a family who built their own church, and explained (11 March 2013):

> *Him stay lellebet all rait, because still him garem church building lo iume save tok together. This time sharim culture insaet lo church.*
>
> It [culture] is still quite all right because church [as an institution] still exists and there we can talk [and come] together. Nowadays we share cultural practices through the church.

Although Arthur speaks of cultural practices, his explanation made clear he was mainly referring to cultural values. Examples of sharing culture through the practice of going to church and organising Masses he mentioned were: no stealing, going home after work (not hanging out on the street), and paying respect to those who are older. It is close to what it preached in the bible, Arthur argued, and can therefore easily be embedded in church.

Briefly stated, community cohesion decreased in Niu Manra to an even greater extent than in Nusa Baruka, and research participants from Niu Manra stated they could no longer be referred to as one community. The geographical separation of Niu Manra was a conscious choice that occurred as a result of conflict over aid, not as the result of initial settlement across various places on higher ground, as was the case in Nusa Baruka. Similar to Nusa Baruka, the declining role and

power of the *maneaba* exacerbated a loss of cultural practices, values, and guidance. Community cohesion was part of such declining cultural characteristics, as well as it contributed to their decline. Similar to Nusa Baruka, smaller groups within one of the two Niu Manra's displayed high levels of intra-group cohesion when having constructed a church which could also be used to pass on cultural values.

7.4.3 Saegeraghi

Saegeraghi, like Niu Manra, split up in two separate villages due to conflict over aid: the original location of Saegeraghi is still known as Saegeraghi, whereas the area on higher ground is known as Mile 6 (see Figure 53). In 2013, villagers of the original Saegeraghi still inhabited these two areas. In both locations it was stated that the conflict was over, but that people have decided to remain separated. This resulted in each village having its own leaders and own United Church. Before the tsunami Saegeraghi had one United Church building, and as the majority of the villagers belonged to this religious denomination, most villagers would frequently come together here.

Nevertheless, despite the initial conflict the two villages are on speaking terms again. Although the inhabitants of each village do not interact as much with one another as they did prior to the tsunami, the understanding between the two villages could be described as one of durable peace; there is a high degree of communication and cooperation, strong shared values, and few tensions (Lund 1996). Family-ties were said to be the main reason for the re-establishment of a level of community cohesion after the initial conflict (focus group 16 June 2012): '*Mifella come out blo onefella granny. Mifella respectim elders.* (We all have the same forefather. We respect our elders)'. A second reason research participants gave was the equality within the original village; people may be uneducated or very educated but all are equal, it was stated. A third reason given was that both villages' main religious denomination is the United Church. Although the fact that each village built its own church did not contribute to re-uniting the original community, the

absence of many different religious groups within the villages did. The few people belonging to a different religious group were considered part of the same community, as they are family. The presence of ties between the villages was clearly observed in May 2012: every evening teenagers from Mile 6 made the one hour walk down to Saegeraghi to play soccer in preparation for an inter-island soccer tournament organised by Save the Children.

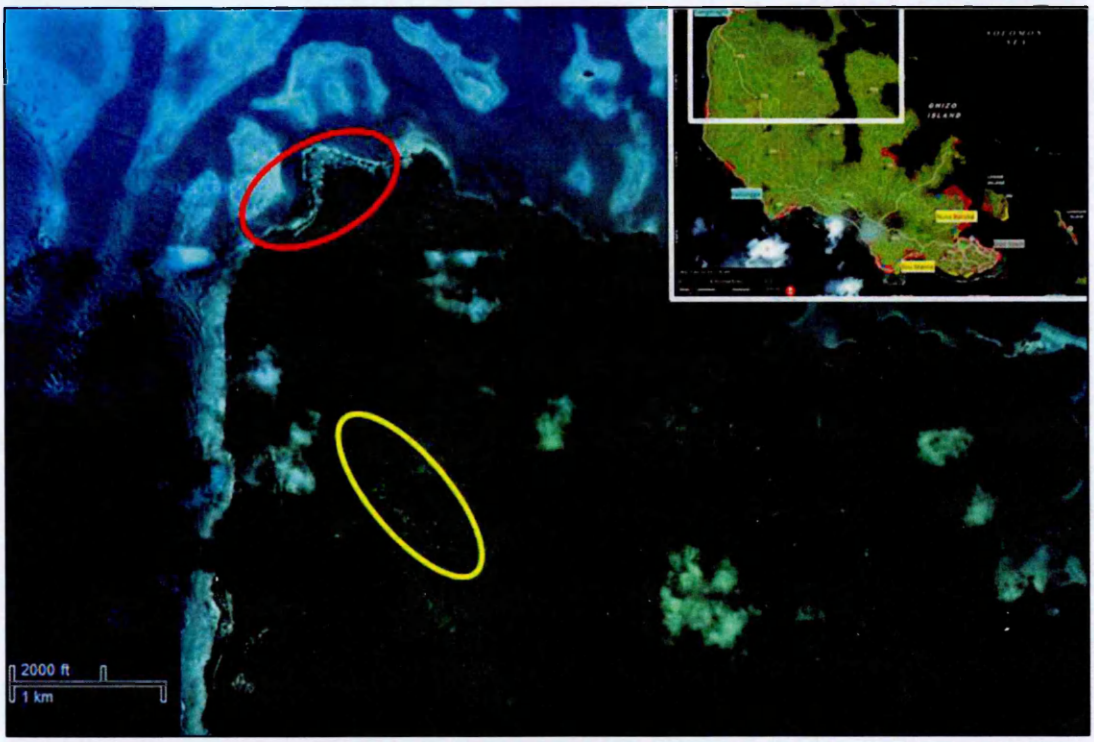


Figure 53 Location of Saegeraghi (red oval) and Mile 6 (yellow oval)
The inset shows the area of Ghizo Island presented by this Figure.
Source: adapted from: Google maps (2013) and UNITAR/UNOSAT (2007).

Not explicitly mentioned as a reason for the re-establishment of community cohesion, but mentioned in the sense of maintaining cultural ties between the two villages was the absolute absence of Gilbertese people inhabiting Saegeraghi and Mile 6. 'They are different', Saegeraghi's focus group participants stated, whilst drawing attention to aspects of the Gilbertese culture they did not like. In the focus group it was argued that although their Melanesian culture is slowly changing[54], it is still strong and people want to keep it that way; Gilbertese are not to marry into

[54] An example of changing cultural practices mentioned is: Traditionally women are not to pass in front of their male family members, and all people are not to pass in front of elders- nowadays this rule is more frequently ignored.

the culture, and if people from other cultural groups within the Solomon Islands marry in, they have to adapt to the cultural notions of the inhabitants of Saegeraghi and Mile 6.

In summary it can be argued that community cohesion slightly decreased in Saegeraghi as a result of conflict over aid. Despite being part of the same family, the presence of amicable relations, and the absence of high degrees of tension, the two groups have decided to remain in separate areas. The people in Mile 6 gave several reasons for not moving back to the seaside. The ones most commonly mentioned were fear of another tsunami, the fertile soil on higher ground, and the coolness the bush provides. They associated the latter with an absence of diseases such as malaria. Unlike in Nusa Baruka and Niu Manra, where the decline in community cohesion was related to conflict and to the decline of traditional cultural norms and values as a result of the loss of the *maneabas*, the loss of cultural values as a result of conflict over aid was minimal in Saegeraghi.

7.4.4 Pailongge

Pailongge differs from the other three villages in the sense that prior to the tsunami the main village of Pailongge served as an umbrella village for the smaller villages located next to it and along the coastal road (see Chapter 2). Geographically speaking, the umbrella village of Pailongge was therefore already quite spread out. In 2013, its villagers still lived scattered throughout the area surrounding the original location of the village, the difference being that the 'sub-villages' were now also spread out, consisting of a part on higher ground and a part near the coast.

In Pailongge's focus group, it was stated that community cohesion decreased as a result of the rise of conflict over aid. As in Nusa Baruka, Niu Manra, and Saegeraghi the conflict was declared over at the time of research, and the situation could generally be described as meeting many characteristics of Lund's (1996) durable peace: there was a certain level of reciprocity, cooperation, and shared values and institutions. Similar to Saegeraghi ancestral and religious ties

played a role in this. As explained in Chapter 2, all people from Pailongge trace back their family-line to the small island of Simbo; they speak the island's language and share its cultural practices. As the majority of Pailongge's people are part of the United Church, religion also helped in re-establishing ties. Pailongge's United Church building was partly damaged by the tsunami but remained in use by its villagers (see Figure 54). Villagers stated they 'realised we separated and tried to pull back together' after the conflict.

Figure 54 Coming together: Mother's Day at the United Church in Pailongge (May 2012)

The conflict was largely disregarded, but the core issues underlying the conflict were not really addressed, and those villagers in relatively influential positions during the time of conflict still exercised power at the time of research. The resentment over what happened continued to be present. Weak spots in intra-village relations had to be treated with care, making the situation in some respects one of stable peace (Lund 1996); the peace does not have the deep roots that durable peace has and tensions play up more often than in Saegeraghi. Mostly people kept quiet on these points of disagreement. In public festivities or meetings they would interact and communicate with each other, including those of whom they suspect were involved in the unequal distribution of aid. However, in day-to-day activities such interactions were limited.

In summary it can be stated that community cohesion decreased in Pailongge, to a greater extent than in Saegeraghi, but to a smaller extent when compared to the Gilbertese villages. Religion and shared cultural practices contributed to preventing the community from falling apart, but the unresolved conflict causes tensions to remain.

7.4.5 Community feeling: implications for community resilience

Many researchers have acknowledged that violated expectations of aid can lead to the weakening of ties within communities (e.g. Amarasiri de Silva 2009, Christoplos 2006, Norris et al. 2008). In a similar vein, the research on Ghizo illustrated that as a result of conflict over aid, affected villages all experienced a weakening of intra-community ties along with a weakening of, or changes in, the components of community cohesion. Specific features of community cohesion affected were: shared values and norms (e.g. lack of disciplining children, not keeping the neighbourhood clean), common means of livelihood (e.g. increased reliance on gardening amongst people in NMT, heavy reliance on the ocean for those living in NMSS), social ties of control, care, and trust (e.g. less trust in leaders), looking after and standing up for each other, and equal rights and opportunities (e.g. less harmonious development, disparities, unequal access to services, and not sharing resources such as water tanks). Due to the power ascribed to Big Men and elders (see Chapter 2), it could be argued that rights and opportunities were not equal prior to the 2007 events either, and that equity as a characteristic of a resilient society (see Table 5) was therefore not present. However, as villagers argued these were not negative features, and fairness and honesty were values preached by everyone, it can be concluded that equity weakened as a result of the conflict over aid. In addition the geographical settlement pattern in the villages changed. As the building-blocks of social cohesion commonly reside within places (Kearns and Forrest 2000), the spatial relocation of the villages contributed to a decline in community cohesion. This decline led inhabitants of the original Nusa Baruka, Niu Manra, and Saegeraghi to explicitly state that their original communities no longer existed.

This post-tsunami decline in community cohesion was strongest in the Gilbertese villages. The erosion of the traditional Gilbertese culture played a large role in this. Since their arrival in the Solomon Islands the Gilbertese struggled with maintaining their extant cultural practices whilst living in a culturally-different society and being disconnected from their original cultural context. As cultural values are major components of the social glue that holds a community together (Kearns and Forest 2000), the pressure on the Gilbertese culture already placed constraints on maintaining community cohesion in the pre-disaster context. The conflict over aid and the loss of power of the *maneaba* placed the maintenance of community unity under duress, contributing to a decline in cohesion intertwined with a further loss of cultural practices and values. These processes reinforced one another, contributing to a greater erosion of culture and decline in cohesion in the Gilbertese ethnic minority group than in the Melanesian majority group. In line with Fukuyama's (1999) observation on family and kinship ties as a source of social unity and harmony, ancestral ties within the Melanesian villages facilitated the partial restoration of community cohesion. Having one major religious denomination aided this process. Nevertheless, in all villages community ties weakened. Although the state of intra-village relations improved in most villages in the years following the conflict (see Figure 55), cohesion within the communities had not regained its pre-disaster strength. Figure 55 illustrates the intra-community relations as discussed in the previous four sub-sections, and based on Lund's (1996) five phases of peace and conflict described in Chapter 6.

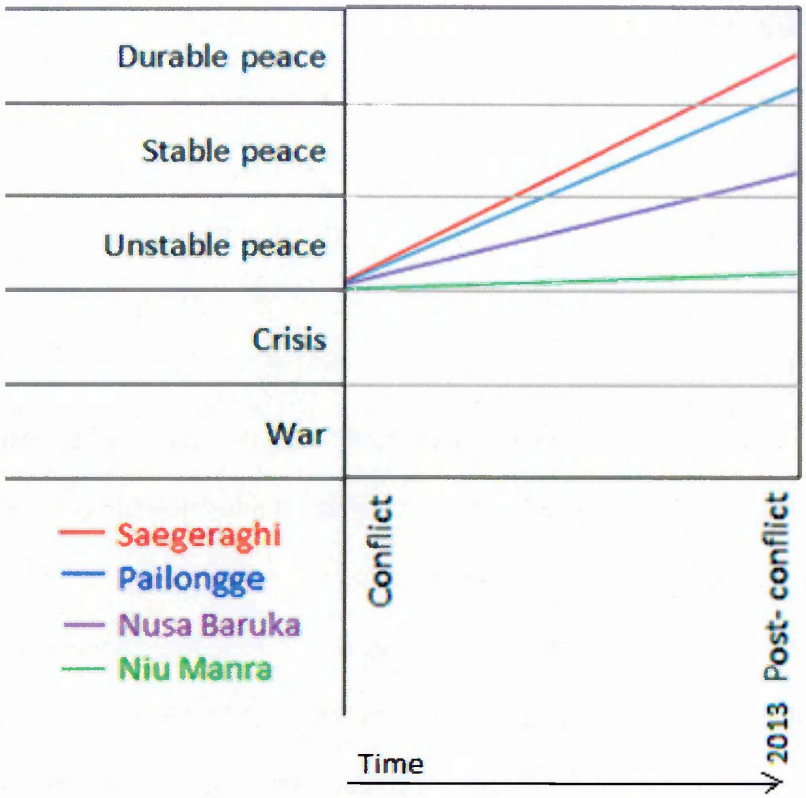


Figure 55 State of intra-community relations (based on Lund's (1996) curve of conflict)
Source: author's compilation.

As indicated by the characteristics of a disaster-resilient society, described in Chapter 3, cohesion is seen as an indicator of community resilience. High levels of association and relationship between community members can have a positive effect on cooperation in times of disaster; there is likely to be a higher extent of sharing of resources and information, and looking after one another (Adger 2000, Bahadur et al. 2010, Norris et al. 2008). Hence a decline in community cohesion can have negative implications for community resilience to future disastrous events. In the context of this research this implies that the resilience of groups of people who viewed themselves as communities at the time of the 2007 events has likely decreased, impacting on their ability to face and overcome future disaster.

7.5 Re-visiting the literature: recontextualising resilience

The changes in the make-up of the affected communities and potential implications for their resilience to future disaster are further explored in this section by drawing connections between

the insights presented in this chapter, the characteristics of resilient societies, and frameworks of how societies in developing countries overcome disaster, discussed in Chapter 3. In doing so it refers to the literature of change, resilience, ethnicity, and long-term recovery in developing countries. However, before doing so, this section first returns to the debate on vulnerability and resilience.

In the opening section of this chapter it was stated that the definition of resilience used influenced the processes of change analysed in this chapter; if other definitions of resilience were used, the processes analysed in this chapter might have been different. It is worth mentioning that if resilience and vulnerability are considered opposite sides of the same coin (e.g. Twigg 2007, Folke et al. 2002), and increasing resilience implies decreasing vulnerability, an additional process of change would have been described in this chapter: that of environmental awareness and maintenance. Environmental and natural resource management and community understanding of the characteristics and functioning of the local natural environment can be seen as characteristics of a disaster-resilient community, argues Twigg (2007). Research on Ghizo indicated that in villages where the protective role of their natural environment was critically doubted, survivors expressed that their attitude towards the protective functions of the environment varied from not having changed to having become more negative. Niu Manra was the strongest example of this. As most of the original village was destroyed by the tsunami, people doubted that the coral reef and mangroves could act as a defence against incoming tsunami waves. Despite knowing about the possible protective functions of their natural environment, they purposefully did not take up any actions to protect these features.[55] In villages where people ascribed a strong protective role to natural features, focus group participants stated that their awareness and caretaking of such features had increased. Saegeraghi stood out in this sense; here people started to look after their Banyan tree, which had provided them with an opportunity of escaping the tsunami waves. Hence, if considering communities' environmental

[55] Through conversations it became clear that villagers of Niu Manra had knowledge of the possible protective functions of their natural environment. They stated this knowledge had reached them via NGOs and geologists doing research on Ghizo.

management as a means of reducing the risk of disaster, and as a characteristic of community resilience, it could be argued that these insights are indicators of changes in the communities' resilience- illustrating reduced resilience in Niu Manra, and enhanced resilience in Saegeraghi. Nevertheless, in the light of how resilience is defined in this thesis, the change in practices of environmental management relate more strongly to the concept of vulnerability rather than to resilience. Therefore this process of change is not analysed in detail in this chapter.

The changes discussed in sections 7.1, 7.2, and 7.3 relate to several entries in Table 5 'Characteristics of resilient societies' in Chapter 3. The increased strength of livelihood diversification relates to entry 1: High diversity. This includes increasing the livelihood-diversification of food-producing activities, and adapting in ways focused on enhancing the diversity of future response options. While the extent to which any change is successful is subjective (Adger et al. 2006), the maintenance of such changes over the longer term is a positive indicator of resilience (Fazey et al. 2011). The very fact that changes were initiated, especially by the Gilbertese, links to entry 4: openness to/acceptance of change. The difficulties in dealing with disaster are in this sense directly associated with changes initiated in the period that followed the disastrous event. The fact that the initiated changes were still present several years later points to a certain degree of openness to change, working with change and embracing it to increase resilience. Both the Gilbertese and Melanesian processes of change testify to 'learning', which is entry number 5 in the table, as well as relating to entry 6: preparedness. Learning from experience contributed to actions initiated to better deal with future disaster. In the case of the Gilbertese survivors these actions were directly related to preparedness measures such as creating gardens and footpaths, and passing on knowledge. Similar actions were further emphasised amongst the Melanesian population. If maintained over time, these processes likely imply an increased resilience. Entry 7 referred to the inclusion of local knowledge, but its explanation made clear that the focus of this entry was on bringing different kinds of knowledge together. Hence, as clarified by the concept of 'locally relevant knowledge' introduced in Chapter

5, the changes also address this characteristic of a resilient society. With regard to the characteristics detailed in this paragraph, it could be argued that the changes had positive effects on the ways the villages display features of a resilient society.

Discussing characteristics of resilient societies in relation to changes initiated by the affected communities, would not be complete in the absence of addressing Oliver-Smith's (1982: 85) claim that 'disaster is the ample demonstration to the individual that his culture, his way of life, has suddenly become inadequate, and insufficient to protect him from the vicissitudes of the environment'. Those who were least able to cope, and suffered the most, initiated larger changes relating to the characteristics addressed above, than those who were more able to respond (see Figure 56). It was the Gilbertese ethnic minority group that made the largest changes, discussed in sections 7.1, 7.2, and 7.3, to be better prepared for future disaster. Such processes relate to the previously discussed notion of a disaster subculture (Wenger 1978) as they draw attention to learning from disaster, which is an important element emphasised in the literature on disaster subcultures. Moreover, these findings add to this literature as the Gilbertese did not merely learn from their own experience with disaster, they learned from their Melanesian neighbours' ways of coping with disaster. The latter is what shaped the direction of their learning and what made them actively initiate changes to increase resilience.

Figure 56 Schematic overview of the relation between capacity to respond and initiated changes to increase resilience
Source: author's compilation.

However, changes in Ghizo's affected communities were not only positive. As Chapter 6 and section 7.4 of this chapter illustrated, disaster aid interventions can have disruptive effects on community resilience. The described decline in community cohesion affected communities' recovery, as well as it may have negative implications for their resilience to future disaster. This decline in community cohesion is a change not positively supported by the affected communities, and is one that generally decreases resilience to future disaster. It was felt strongest in the ethnic communities who in the pre-disaster period experienced the strongest degree of erosion of traditional cultural values and practices which were considered important elements associated with their ethnic identify. Being migrants from a culturally-different context, the Gilbertese ethnic minority group therefore not only initiated the largest extent of change aimed at strengthening resilience (as discussed above), but also experienced the largest changes that can be considered as negatively impacting on resilience. The changes addressed in section 7.4 relate mostly to entry 2 and 3 in Table 5: social values and structures, and the degree of equity. The reduced faith in Big

Men and elders, and the fact that former communities no longer considered themselves as communities, illustrates the reduced social capital and cooperation within each of the four villages. In all these villages the feeling of community cohesion declined and the level of suspicion towards former fellow community members was higher than it was in the period prior to the 2007 events. When analysing changes relating to these two characteristics, it could be argued that these indicate a reduced resilience in all four affected communities.

Chapter 3 illustrated that discussions of resilience in developing countries can be largely categorised into three frameworks touching on change or the absence thereof. Briefly recapitulated, the first framework argues that developing societies are unable to cope with disaster and that they need external resources to recover (e.g. Burton et al. 1993, Dynes 1975). The second framework states that developing societies can recover on their own and do not need to modify the fundamentals of their social organisation (e.g. Cijffers 1987, Holland and VanArsdale 1986). Gaillard (2007) argues that followers of this second framework claim that if there is a temporary incapacity of developing societies to overcome disastrous impacts, it is due to the foreign relief aid that disrupts affected communities' resilience systems. The third framework views disaster as a catalyst for on-going cultural changes related to globalisation and modernisation (e.g. Oliver-Smith 1996, Torry et al. 1979). Chapter 3 continued by presenting Gaillard's (2007) addition to these three frameworks: a fourth framework moving away from the focus on the susceptibility of developing societies that characterises the former three frameworks, and adding a focus on an active attitude of affected communities, one of initiating change to cope with the disastrous impacts of the hazard (Gaillard 2007: 525). This fourth framework links change to increasing resilience.

The findings presented in this chapter place emphasis on the notion of change. In doing so, they relate to the above-mentioned frameworks in various ways, despite the absence of the notion of change in the first two frameworks. The inability of (groups in) developing societies to cope with

disaster, as emphasised in the first framework, shows resemblance to what the Gilbertese survivors experienced in the immediate aftermath of the disaster. Considering the position of the Gilbertese ethnic minority in the Solomon Islands, it could be argued that their ways of coping are not representative of how a developing society as a whole deals with disaster. However, it is important to consider this first framework when addressing change as an element of resilience as the Gilbertese survivors' difficulties in coping with disaster inspired the changes they subsequently initiated to enhance their resilience. The changes both ethnic groups initiated relate to the second framework in the sense that the influx of foreign aid disrupted the affected communities' resilience systems. The arrival of aid resulted in a reduction of the communities' necessity to deal with disaster on their own. This relates to change as the shift from relying on their own coping mechanisms to relying on aid ultimately led to the rise of conflict and the weakening of intra-community ties.

The processes of change analysed in sections 7.1, 7.2, and 7.3 of this chapter, especially those observed amongst the Gilbertese population, also relate to the third framework. The changes aimed at increasing resilience, and initiated by the Gilbertese communities, resemble the idea of 'disaster as a catalyst for ongoing changes related to globalisation and modernisation', only are the changes not directly related to globalisation, but to the processes associated with permanently residing in a culturally-different context. Additionally, these processes relate to Gaillard's addition to the three frameworks, as the emphasis on affected communities actively initiating change reinforces the notion that communities are not passive and powerless spectators when dealing with disaster. However, adding to Gaillard's framework, it was also recognised that although these changes were initiated throughout the recovery process, they were not so much aimed at overcoming the disaster experienced, but at increasing resilience to future disasters; the changes were especially aimed at the critical period between the occurrence of hazards and the arrival of aid following those hazards. Hence, these insights indicate that resilience in the sense of initiating change can also be associated with longer-term adjustments. In this sense increasing

resilience is rooted in making choices about preventing future losses. This is not to say that the process of initiating change to increase resilience to future disaster is a process that stands on its own; it is embedded in and related to the experience of dealing with the disaster experienced, or failing to do so.

Examining the findings presented in sections 7.1 to 7.4 in relation to the frameworks discussed, illustrates that resilience in developing countries cannot be addressed within the limits of one framework. Whereas the community-initiated changes on Ghizo Island at first appear to relate more to the third and fourth framework, as the first two frameworks do not address change, further discussion illustrated that the changes have roots in the approaches detailed in the first two frameworks. The changes discussed in sections 7.1 to 7.3 were more associated with (difficulties in) coping with disaster, whereas the changes discussed in section 7.4 were more associated with disruptions to resilience systems, eventually affecting community relations. What the findings add to the frameworks is that they place emphasis on changes having an influence on resilience to future disasters. This concerns both changes not directly initiated with the aim of improving resilience and changes that are directly aimed at improving resilience. None of the abovementioned frameworks explicitly addressed this.

In relation to this, the changes discussed in sections 7.1, 7.2, and 7.3 place particular emphasis on agency in relation to resilience and power as survivors from both ethnic groups demonstrated active attitudes in strengthening their ability to withstand debilitating effects of future natural hazards. The differences between the Melanesian and Gilbertese ethnic groups' ways of dealing with disaster draw attention to adaptive capacity, especially with regard to conditions or elements necessary to enable adaptation, and the ability to mobilise these conditions (Nelson et al. 2007). Section 7.2 in particular illustrated this: whereas both the Gilbertese and Melanesian ethnic groups had access to means to diversify their livelihoods in the sense of living of the land and sea, this valuable resource for dealing with disaster had not been fully embedded in the

Gilbertese way of life on Ghizo. The conditions for increasing their resilience in this way were present, but it was not until the experience of a disaster that they mobilised elements of these conditions and initiated changes in their livelihood practices. In this sense, the experience of a disaster developed their agency to deal with future disaster. It is the access to resources as well as the willpower to draw on these resources that contributed to the Gilbertese communities initiating change.

7.6 Conclusion

This chapter examined and analysed how the post-disaster processes of response (Chapter 5) and the conflict related to the aid interventions (Chapter 6) influenced the affected communities' longer-term socio-cultural development, impacting on changes relating to indicators of resilience to future disaster. The foremost conclusion that emerges from this chapter is that there were positive and negative long-term changes in the affected communities' characteristics, which relate to characteristics of a resilient society.

Positive changes were mostly shaped by the affected communities' experiences of responding to the 2007 events, as analysed in Chapter 5. These changes consisted of the increased passing on of knowledge of tsunamigenic earthquakes, including ways of reacting to such events, and the increased strength of livelihood diversification. Furthermore, these changes related positively to several characteristics of resilient societies as identified in Table 5 in Chapter 3, hence indicating an increased resilience to future disaster. The changes were most prominent amongst the Gilbertese ethnic minority group, as they had been least able to respond in a self-reliant manner. Their changes reflected the adoption of practices that proved to be of value in their Melanesian neighbours' means of responding to the earthquake and tsunami.

Although these changes and learning processes almost naturally links to the notion of disaster subculture, what stands out here is how the presence of two ethnic groups living in close

proximity to one another shaped the development of such a disaster subculture. It is more than Anderson's (1965) emphasis on learning from experiencing disaster; it is the learning from the ways a neighbouring ethnic group experienced disaster that played a role in the development of a disaster subculture. It can be argued that these changes, if maintained over time, can increase the Gilbertese ethnic group's capacity to deal with and overcome future disaster of a rapid-onset nature, reducing the differences in resilience between the two ethnic groups. It bears an interesting similarity to the idea of 'disaster as a catalyst for ongoing changes related to globalisation and modernisation', as expressed in literature addressing change in relation to resilience in developing countries (e.g. Oliver-Smith 1996), the difference being that the ongoing changes are not (directly) related to globalisation, but to the permanent exposure to and influence of a culturally-different context.

Negative changes were mostly related to the findings presented in chapter 6: the conflict over aid and the subsequent erosion of community cohesion. Looking back at the characteristics of resilient societies, as presented in Table 5, these changes relate in a negative manner to entry 2 (social values and structures) and entry 3 (high degree of equity). There was a loss of cooperation and coordination within the four affected communities. Moreover, they stopped referring to themselves as communities, especially not as equitable ones. Also in this respect the Gilbertese minority group underwent the largest changes, as evaluated six years after the events. Although no guarantees can be given for the direction of these changes over the coming years, the changes shape the current capacity of resilience of all four communities affected by the 2007 events. If continued over time, these changes could negatively impact the capacity to deal with and overcome future disaster as a community in which people help one another. Considering the lack of (partial) restoration of community ties in the Gilbertese villages, these are most likely to experience the largest negative impacts of this.

It cannot be concluded if the positive changes outweigh the negative ones, or vice versa, or that they balance each other. The nature of this research does not permit such conclusions to be drawn. With regard to the definition of resilience, a few conclusions can be made. Relating to the positive changes or modifications indicative of resilient societies, acceptable standards of living were reached in all villages. Interesting is that this state of living had not been perceived as 'acceptable' by the Gilbertese prior to the 2007 events; they had largely refrained from adopting practices they considered part of the Melanesian culture. Relating to changes indicative of a reduced resilience, it is an accepted standard of living in the sense that people tolerate it. However, in all of the four villages, it is not one that is embraced by all, and is not satisfactory when viewed by the standards of a community as present prior to the 2007 events.

Chapter 8

Conclusion

The research presented in this thesis was guided by the main research question: In the aftermath of the 2007 Solomon Islands earthquake and tsunami, how have disaster management processes informed community resilience?. To address this question, and guide the research, three sub-questions were formulated: A) How did ethnically different communities respond to the same event?, B) How did aid interventions influence communities' disaster management processes?, and C) How did communities' responses and aid interventions influence long-term recovery? As detailed in previous chapters, these three sub-questions were addressed primarily in chapters 5, 6, and 7.

To answer these questions, an extensive programme of research was carried out on Ghizo Island, one of the islands hardest hit by the 2007 events. As there were differences in how the Melanesian ethnic majority group and the Gilbertese ethnic minority group were affected, fieldwork was carried out in two Gilbertese villages and two Melanesian villages on this island. The methodology used enabled a comparative analysis between the two ethnic groups. The results of three periods of field-research were predominantly presented in the previous three chapters, which demonstrated that analysing disaster management processes has the potential to provide insight into affected populations' resilience to past events as well as to indicators of their resilience to future disaster.

By discussing how the Gilbertese and Melanesian ethnic groups responded to the earthquake and tsunami (sub-question A), Chapter 5 examined the groups' past resilience. This enabled Chapter 7 to provide a detailed analysis of how the ethnic groups' capacities to respond served as a stimulant for changes in behaviours and actions, aimed at increasing resilience to future events

(sub-question C). By discussing how aid interventions influenced the affected communities' disaster management processes (sub-question B), Chapter 6 made explicit the analytical puzzle of examining resilience when aid interventions alter communities' ways of dealing with disaster. Furthermore, it provided insights into the affected communities' perceptions of aid interventions, which provided the foundations for Chapter 7 to address changes in the long-term socio-cultural development of the affected communities, indicative of their future disaster resilience (sub-question C). Hence, Chapter 5's specific contributions to answering the main research question were the analysis of past resilience and providing the basis for understanding how affected communities strengthened or adopted practices that are seen as characteristics of resilient societies. Chapter 6 also provided knowledge necessary for understanding developments that can be linked to changes in resilience, while Chapter 7 discussed and analysed these changes.

The three following sections discuss how each of the sub-questions were addressed and answered by the preceding chapters. Each section starts by summarizing the findings relevant to that question. In doing so, reference is made to the main research question by explicitly detailing how disaster management processes informed resilience. Subsequently each section addresses how these findings build upon and expand the existing literature. Where applicable the sections also provide recommendations for disaster aid organisations based upon the empirically-grounded insights that this thesis has yielded. Section 8.4 details the contributions to existing knowledge as well as new insights generated.

8.1 Sub-question A: reactions and coping mechanisms

How the ethnically different Melanesian and Gilbertese communities responded to the earthquake and tsunami that affected them both was analysed primarily in Chapter 5. Examining the ethnic groups' reactions, as the first stage of their responses, revealed that locally relevant knowledge of tsunamis and tsunamigenic earthquakes, the local physiography, and footpaths associated with gardening, were the main factors shaping differences in how the two ethnic

groups reacted. With less locally relevant knowledge of earthquakes and tsunamis, being more disadvantaged by the local physiography, and having fewer footpaths leading uphill that could be used as evacuation routes, the Gilbertese communities were less resilient in terms of their capacity to react to the events. Examining the two groups' coping mechanisms, as the second stage of their responses, revealed that the absence or presence of locally relevant disaster subcultures, defined as subcultural patterns geared towards the solving of problems arising either from the awareness of disaster threat or from having experienced disasters (Anderson 1965: 3), and the strength of livelihood diversification, shaped the communities' coping mechanisms in a combined manner. Having fewer gardens, little knowledge of wild foods, and a lack of knowledge of traditional means of cooking, again placed the Gilbertese ethnic group in a disadvantaged position. Examining the differences in coping between the groups, it can be concluded that the Gilbertese communities were less resilient in terms of their coping capacity when the tsunami struck.

In addressing sub-question A, Chapter 5 contributed to answering the main research question by providing insights into the resilience of the two ethnic groups to the events faced, through examining how they reacted to and coped with disaster. By doing so, it served as an empirical example supporting Aldrich's (2012) and Bird et al.'s (2011) argument that assessing affected communities' processes of disaster management generates knowledge on how resilient the communities were to events faced. Additionally, the understanding gained confirms Gaillard's (2008, 2007) and Paton et al.'s (2006) argument that pre-disaster differences between (ethnic) groups inhabiting the same area, influence their resilience by shaping their capacity to cope with disaster. The findings presented in Chapter 5 extended Gaillard's (2008, 2007) and Paton et al.'s (2006) argument by indicating that such differences also influence the capacity to react to disaster; it resulted in differences in survival rates in reacting to the 2007 tsunami. In particular, the role food-producing livelihoods can play in this (e.g. through the absence or presence of paths

associated with gardening, which could be used as evacuation routes) is an important aspect that is not frequently addressed in research.

One of the more distinctive features of the way this research addresses responses to past events is that it bridges a gap between two fields of study. On the one hand, there are the studies highlighting the value of analysing disaster management processes by carrying out research in the affected area and with affected people, but that often fail to address the importance of thoroughly considering how commonalities and aspects associated with ethnicity influence disaster management processes in this context (e.g. Bird et al. 2011). On the other hand, there are the studies addressing ethnicity, and associated elements such as marginalisation, discrimination and the unequal distribution of political and economic power, as a key factor influencing response, but that largely refrain from carrying out fieldwork of a similar participatory nature as done in this research (e.g. Amarasiri de Silva 2009, Gaillard et al. 2008).

Answering sub-question A provided the observations and insights necessary to understand the changes the ethnic groups initiated in building back their lives, as these were initiated based on lessons learned from experiencing the events. These changes were mainly discussed in Chapter 7 and are further analysed in section 8.3.

8.2 Sub-question B: aid interventions

How aid interventions influenced communities' disaster management processes was mainly addressed in Chapter 6. In line with Rose (2004), the chapter started by arguing that aid interventions external to the daily routine of a community are not part of that community's resilience. The disaster management processes discussed in Chapter 6 therefore provided little to no information on the affected groups' resilience to the 2007 events. Nevertheless, these processes were of considerable value in providing insight into changes in the affected

communities that relate to characteristics of resilient societies, especially with regard to community cohesion.

Examining how aid interventions influenced disaster management processes was carried out by investigating the Gilbertese and Melanesian Solomon Islanders' perceptions of the aid interventions. Chapter 6 largely focused on aid interventions with less of a humanitarian character and more of a focus on recovery, as the survivors' frustrations with the latter type of aid interventions influenced changes in the communities' characteristics associated with indicators of resilience. The way these aid interventions were structured caused frustration and disapproval amongst survivors, centred particularly on two thematic areas: 1) the lack of cooperation and collaboration amongst aid agencies in assessing needs, and 2) aid donors' choices of 'local' personnel in relation to pre-existing power relations. Aid agencies overlooking issues of ethnic discrimination, *wantoks*, and intra-community hierarchical relations in employing 'local' people from the Solomon Islands (who were not always local to the affected region) caused survivors to feel that there were inequalities paired with discrimination in the assessment and distribution of aid. In this manner, aid interventions played a large role in exacerbating pre-existing power relations, resulting in intra-community conflict in all four communities.

In addressing sub-question B, Chapter 6 paralleled the argument made by Mulligan and Nadarajah (2011), who argue that little community consultation is needed when delivering humanitarian aid, as the focus should be on providing plentiful aid with maximum speed and efficiency. During humanitarian aid interventions, the manifestations of pre-existing power relations on Ghizo were relegated, which prompts a rethinking of Amarasiri de Silva's (2009) emphasis on the need for a thorough consultation of (ethnic) communities' needs. Nonetheless, the findings presented in Chapter 6 also demonstrate that Amarasiri de Silva's (2009) point of concern is more than legitimate when aid interventions move away from stabilising the emergency situation and shift towards recovery. The lack of consultation and limited knowledge about the communities,

resulting in aid organisations inappropriately adopting a 'bottom-up' approach by employing 'local' people who had no affiliation with the groups of survivors they were working with, illustrated this.

What these insights add to existing works is that elements associated with ethnicity should be taken into account, but should not take the centre stage at the cost of a focus on a rapid delivery of humanitarian assistance. Moreover, the findings relate in an interesting way to literature promoting the use of local resources, such as employment, as part of bottom-up approaches in development (e.g. Craig and Mayo 1995) and humanitarian work (e.g. Clarke and Ramalingam 2008), as well as relating to literature criticising the lack of local people's actual ownership in such processes (e.g. Brown et al. 2014). The aid interventions on Ghizo show that a rather important step is at times overlooked in the focus of these literatures, as well as in the practice of delivering aid to areas hit by disaster: verifying that 'local' people are indeed local to the specific context. In line with Mohan and Stokke's (2000) reasoning, this indicates the importance of a stronger emphasis on the politics of 'the local' in the sense of not romanticising the local context and paying more attention to local social inequalities.

Flowing from this are several recommendations for international disaster aid organisations that have in-country offices in disaster-affected areas, or that work with local civil society organisations in disaster management. A first recommendation to consider is that even when local nationals are employed to assist in the aid interventions, survivors may nonetheless view the aid interventions as expatriate-driven approaches that are top-down in nature. The research on Ghizo provided an example of the ways in which the differences in roles adopted by expats and Solomon Islanders contributed to this viewpoint. Careful consideration should be paid to how top-down and bottom-up approaches are viewed by those who constitute the 'bottom', namely local communities, and by whose standards and values these approaches are developed and evaluated. In line with Cooke and Kothari's (2001) argument that those 'at the bottom' may not have a voice

to comment on the decisions of those 'at the top', it is important to consider that what the 'top' sees as bottom-up may not be bottom-up according to the 'bottom'. Related to this is a second point of emphasis: careful attention should be paid to identifying local stakeholders, and local power relations should not be downplayed. This argument is not new. For instance, it has been expressed by Mohan and Stokke (2000) in their discussions on the dangers of localism in participatory development. However, this research extends its application to the field of recovering a state of living, instead of enhancing its development, by providing empirical examples embedded in processes of disaster management. As explained above, the impacts of selecting 'local' people who are not local can exacerbate pre-existing power relations. Once again this illustrates the importance of carefully considering and being culturally sensitive to the local context in aid interventions. A third recommendation is to enhance cooperation and coordination between organisations involved in the aid interventions. Again, this is not a new insight - authors such as Bennet (2013) have addressed in detail the benefits of, and shifts in, working together. The research on the Solomon Islands made clear that aid organisations indeed worked together in the aftermath of the 2007 hazards, but only after initially approaching the situation separately. Cooperation reduces the chance of raising unrealistic expectations of aid amongst the affected population and limits the risk of a duplication of efforts. Outdated disaster management plans, such as that of the NDMO which had undergone minimal revisions since 1987, commonly provide limited guidance to ways of working together. A regularly updated disaster management plan which sets out managerial and operational responsibilities, details on how actors involved in emergency management should work together, and presents structures for the escalation of the organisational response, can be seen as a prerequisite for strengthening coordination and cooperation.

Chapter 6, with its main focus on answering sub-question B, provided the evidence and analysis necessary for understanding the changes in the Gilbertese and Melanesian intra-group dynamics that manifested themselves in the groups' longer-term recovery. These relate to changes in the

ways they display characteristics of a disaster-resilient society, and therefore possibly influence future disaster resilience. These changes were discussed primarily in Chapter 7 and are now considered further in sub-section 8.3.

8.3 Sub-question C: long-term recovery

Chapter 7 predominately addressed sub-question C: how did communities' responses and aid interventions influence long-term recovery?. Like sub-question A and B, sub-question C focuses on processes of disaster management. However, sub-question C differs from the previous two sub-questions as it was shaped by and built on the processes analysed in Chapters 5 and 6- processes which triggered changes in the make-up of the affected communities. These changes are part of their long-term recovery, relate to characteristics of disaster-resilient societies, and therefore provide indications of the affected communities' resilience to future disaster.

Chapter 7 first analysed how the reactions and coping mechanisms as analysed in Chapter 5 stimulated communities to make changes and reinforce practices that can be seen as characteristics of a disaster-resilient community (see Table 5 in Chapter 3). By exploring these changes it became clear that those who faced the most difficulties in responding to the 2007 earthquake and tsunami, actively initiated the largest changes in their socio-cultural fabric to increase their resilience to similar events in the future. It was the Gilbertese ethnic minority group who suffered most and who consequently made the most drastic changes. Six years after the 2007 events many of the changes made still had a place in numerous Gilbertese households. They continued to pass on earthquake and tsunami-related knowledge to their children, and parts of the villages are located on higher ground. Additionally, they have increased their livelihood diversification by moving away from their dominant reliance on ocean-based livelihood activities towards the adoption of food-producing practices of different natures and in other geographical areas. In comparison, the Melanesian ethnic majority group was much more capable of coping with the events. For the Melanesian survivors the differences in impact between them and the

Gilbertese served as a reminder of the importance of their locally relevant disaster subculture and the strength of livelihood diversification. They maintained and reinforced their pre-established spread in food-producing livelihood activities, and continued passing on knowledge of wild edible plants and practicing traditional means of cooking. They placed an increased emphasis on practices and features in their environment which, prior to the 2007 events, they had not explicitly linked to disaster management but nonetheless proved to be important. Examples of this are the presence and maintenance of footpaths and the availability of knowledge of tsunamigenic earthquakes. Additionally, they started passing on knowledge on tsunamis and tsunami-genic earthquake. In short, the processes analysed in Chapter 5 led to positive changes in the Gilbertese villages displaying characteristics that are indicative of an increased resilience to future disasters with similar features as the tsunami, and to equally positive, but smaller, changes and reinforcements of practices amongst the Melanesian Solomon Islanders.

Chapter 7 continued by analysing how the conflict in relation to disaster aid interventions (as presented in Chapter 6) contributed to changes in the ways the four affected communities' displayed characteristics of a disaster-resilient community. Unlike the changes analysed with regard to the processes described in Chapter 5, the changes presented in the second part of Chapter 7 were of a more negative nature; the conflict over aid led to a decline in cohesion in all four affected communities. Six years later, this still implied that the inhabitants of Pailongge, Niu Manra, Nusa Baruka, and Saegeraghi no longer considered themselves communities, whereas they had done so prior to the 2007 events. The decline in cohesion was strongest in those communities who in the pre-disaster context struggled to the greatest extent with maintaining their cultural and community cohesion. Originating from Kiribati, these were predominately the communities of the Gilbertese ethnic minority group. In these communities the aid-related conflict furthered a significant decline in community cohesion. The Melanesian communities also experienced a decline in community cohesion. However, in the pre-disaster context they had not struggled as much with maintaining their culture as the Gilbertese had. Factors promoting a

strong sense of unity, such as religion, family and kinship ties, and a shared localised history, facilitated a partial restoration of community cohesion within the Melanesian communities. As a high level of community cohesion is an indicator of a disaster-resilient community, the decline in community cohesion that this thesis has documented is likely to negatively affect resilience to future disaster in both ethnic groups, but particularly in the Gilbertese minority group.

In addressing sub-question C, Chapter 7 contributed to answering the main research question by providing insight into changes in indicators of resilience. The positive changes provide confirmatory evidence to support Gaillard's (2007) argument that disaster-affected populations frequently make changes in their pre-disaster way of life to aid recovery. The findings presented expand this argument by stating that these changes are aimed at improving resilience to future disaster. This is an important element for aid organisations to keep in mind; their aid interventions, particularly those that are carried out over several years, should be flexible and be able to take into account and work with such local developments. As argued previously, careful attention should be paid to the politics of the local. With regard to the negative changes in the ways the affected communities displayed characteristics of resilient societies, the findings presented support Amarasiri de Silva (2009), Christoplos (2006), and Norris et al.'s (2008) claims that violated expectations of aid can lead to the weakening of ties within and between communities. At the time of research on Ghizo, Oxfam, the organisation coordinating the disaster aid interventions on this island, was no longer present. However, the disturbed community cohesion related to the aid intervention was still present. This suggests that the politics of aid interventions are therefore not confined to the timeframe in which they take place. It is important for aid organisations to consider the negative legacies that may occur beyond the life of their interventions, and work towards finding solutions on balancing meeting local needs for aid and minimising negative externalities. Flowing from this is the recommendation for aid organisations to consider the plausible consequences of their work by carefully analysing the local context. This is not to suggest that aid interventions can be fully unproblematic when the local

context is taken into account to a greater extent; there may still be local processes that are too complex to grasp or that unfold as the aid interventions take place.

To extent to which the changes that have taken place in the affected communities will influence the actual resilience of the ethnic groups to future events cannot be concluded; several factors are salient in this respect, including the timing and magnitude of the next event. However, based on the ways the practices revived after the 1997 El Niño contributed to the Melanesian Solomon Islanders' responses to the tsunami ten years later, it is likely that the post- 2007 changes will be of influence the affected communities' resilience to future similar events if such events were to occur within a relatively short timeframe.

8.4 Contributions to knowledge

This research advances knowledge in the field of hazard and disaster studies in several ways. How the gaps in existing knowledge, discussed in Chapter 1 and 3, were addressed, is evaluated below in sub-section 8.4.1, whereas sub-section 8.4.2 details how this research adds to existing research and provides new insights.

8.4.1 Reducing the gaps in literature

With its focus on analysing processes of disaster management in relation to community resilience, and doing so in an ethically-diverse setting in a developing country, this thesis is an addition to the limited amount of literature available in this field. Chapter 1 explained that a key research need informing this study was to analyse communities' processes of disaster management in order to generate a better understanding of their resilience to the disaster experienced and to provide knowledge on indicators of those communities' resilience to future disaster (Aldrich 2012, Bird et al 2011, Birkmann 2010). The exact scope of the research was further shaped by the gaps in the literature as described in Chapter 3: the shortage of studies on disaster management processes in developing countries, addressing ethnicity, and resilience and change.

Through its focus on the Solomon Islands, this research addresses Keraminiyage et al.'s (2008) claim there is a need for research on disaster management processes in developing countries as these processes differ from those in developed countries. Furthermore, this research is original in its geographical context. It analysed response and recovery in a SIDS that is also a PIC, and therefore addresses an area different from that of most studies focusing on developing countries, many of which address the Indian Ocean Tsunami of 2004. By focussing on ethnically diverse communities, this research addresses the shortage of SIDS studies focusing on social impacts of hazards at community-level, as expressed by Kelman and West (2009) and Méheux et al. (2007), and the role ethnicity plays in variations in communities' responses and recovery (Gaillard et al. 2008). Additionally, the research provided detailed insights into changes initiated by these ethnically diverse communities, therefore adding another example to the small number of studies welcoming the notion of change in addressing resilience (Birkmann et al. 2010), particularly in the context of developing countries (Gaillard 2007). These changes were paired with and reflected the increased risk perception of tsunamis, and therefore provide an addition to the shortage of studies detailing how risk perception can change over time (Twigg 2013). This research therefore makes a significant contribution to filling the gaps in the literature identified and discussed in Chapters 1 and 3.

8.4.2 Originality, providing new insights, and supporting existing knowledge

By addressing the above-mentioned gaps in the literature, support was provided for several key arguments put forward by earlier studies. Furthermore, original contributions to knowledge emerged in the research process. Research on the response and recovery of affected ethnically diverse communities, coupled with analysing changes taking place throughout these processes, provided knowledge both on the resilience of the Gilbertese and Melanesian communities to the 2007 earthquake and tsunami, as well as on indicators of their resilience to future disaster. Hence, this thesis provides empirical support for the argument that analysing disaster management processes can enhance understanding of how resilient communities were to past hazards as well

as providing insight into these communities' indicators of resilience to future disaster. Furthermore, it supports the argument that change can be part of resilience in the sense of establishing an accepted level of functioning that is different from the pre-disaster condition. This argument is extended by claiming that change aimed at increasing resilience can be actively initiated, not only in order to survive in the present, but to prepare for future disaster.

Additionally, the research provides support for the claim that ethnically diverse groups can demonstrate differences in their reactions, coping mechanisms and recovery of disaster (e.g. Gaillard et al. 2008, Telford and Cosgrave 2007). The previous chapters illustrated that the Gilbertese and Melanesian ethnic groups' disaster management processes were characterised by differences, particularly in the ways they responded to the 2007 events. It is therefore a major conclusion of this research that future studies addressing disaster management processes should pay considerable attention to the ethnic context.

To date there are relatively few studies with a significant focus on ethnicity in disaster management in developing countries. In addition, there are a limited number of studies addressing change and resilience in a disaster management context. Moreover, there is an even smaller corpus of studies combining both areas of study. Building on these two topic areas, the research presented is therefore an addition to this small field of literature. Not surprisingly, many of this study's contributions to the existing literature and knowledge thus stem from the findings relating to both change and ethnicity, and demonstrate a significant interaction between ethnicity and change in a disaster management context.

A key contribution to knowledge is related to the influence of an ethnically diverse environment on changes initiated to strengthen resilience. Chapter 3 and 5 discussed Anderson's (1965) concept of a disaster subculture - a concept that has been widely used and extended throughout the years, but in doing so the role of ethnicity has been largely overlooked. What the research on

the Solomon Islands presented in this thesis illustrated is that groups in an ethnically diverse setting develop disaster sub-cultures not only based on their experiences of disaster, but also on other groups' experiences with the same event. Chapter 7 analysed how the Gilbertese changed behaviours and practices with the aim of increasing resilience based on the differences between their ways of responding to the 2007 events and the Melanesian Solomon Islanders' ways of doing so. It draws attention to the added value an ethnically diverse setting can provide for learning from disaster. This explains why ethnically diverse groups inhabiting the same area and affected by the same disaster, can display large differences in actively-initiated processes of change aimed at increasing resilience to future disaster.

It could be argued that such differences in coping existed because the Gilbertese had only been living in the Solomon Islands for several decades, and had not experienced a tsunamigenic earthquake which could have enhanced their development of a locally relevant disaster sub-culture. However, in this context, this argument is refuted as the Melanesian Solomon Islanders' coping mechanisms had most recently been shaped by a climatic hazard one decade earlier (the 1997 El Niño), not a geological hazard of a similar nature to the 2007 events. The Gilbertese had experienced El Niño, but had not been adversely affected because of their culturally-different livelihoods. Therefore they had not developed practices of value to coping with the tsunami. Noteworthy about this is that the distinction between climatic and geological hazards, as events addressed by different disciplines in science, appears to be rather arbitrary in a context in which their impacts and legacy can be so intertwined.

Related to the Gilbertese adopting Melanesian practices, such as gardening and increasing knowledge on wild edible plants, is the change in the Gilbertese migrants' perceptions of cultural adaptation. In focus groups, the Gilbertese expressed a concern with the loss of traditional Gilbertese values and practices as well as the difficulties with maintaining their culture in another cultural context. However, as a result of experiencing the 2007 events, and becoming aware of

the potentially life-saving practices embedded in the Melanesian culture, they acknowledged that the amalgamation of cultural practices could also provide beneficial aspects. Taking this in consideration, it could be argued that experiencing a disaster has the potential to reduce cultural differences between ethnically diverse groups living in the same area. Additionally, it can change the views different ethnic groups have of one another's cultures.

This thesis also broadens the insights into less-positive processes of change potentially affecting resilience, by illustrating that failing to anchor aid interventions in on-going societal processes can result in weaknesses in these aid interventions and long-term negative legacies with regard to the disaster-affected populations' community cohesion. This not only concerned the differences between the Gilbertese and Melanesian ethnic groups, but addressed power-relations on an intra-community level as well. It extends Amarasiri de Silva's (2009) claim that pre-existing inter-community power relations intensify during aid interventions to include intra-community power relations. It is argued that the presence of aid as a new commodity, including the provision of materials not previously owned by communities, can challenge and re-define pre-existing social relations (whether inter- or intra community), especially with regard to materials aimed at rebuilding lives and livelihoods. Additionally, a partial re-thinking of Amarasiri de Silva's claim was prompted as the research illustrated that pre-existing relations did not intensify during the presence of an abundance of humanitarian aid; only when aid interventions shifted in focus to recovery, these relations again came to the fore in a challenging manner. It can therefore be argued that pre-existing power relations (e.g. related to ethnicity or intra-community power relations) should be taken into account, but should not take the centre stage at the cost of a focus on the rapid delivery of humanitarian assistance. These insights provide valuable information on the strengths and weaknesses of disaster aid interventions, and stress the importance of bridging disaster aid interventions with sustainable development. They present an empirical validation of Bird et al.'s (2011) and Varda et al.'s (2009) claim that the study of disaster management

processes can provide valuable information for designing and executing disaster management interventions.

A more specific contribution relates to the immense prominence a physical establishment can play in maintaining culture. In the Gilbertese culture the *maneaba* is the centre of community life and the basis of Kiribati identity. It is the place where a community gathers, where elders uphold cultural norms and values, take decisions on the community, resolve conflicts, and seek justice. The 2007 earthquake and tsunami contributed to a rapid decline in the value of the *maneabas* in the Gilbertese villages. This furthered a greater erosion of culture and cohesion in the Gilbertese ethnic minority group than in the Melanesian majority group. An interesting preliminary observation is the growing importance of churches as institutions that promote social cohesion and through which cultural norms and values can be transmitted when *maneabas* fail to fulfil this role. It is an original and significant secondary finding of this research, but remains relatively unexplored.

In addition to these insights largely related to ethnicity and change, there is the conceptual aspect of a contribution to knowledge, which in this case literally concerns knowledge. Chapter 5 showed that the life-saving knowledge of the Melanesian Solomon Islanders was inaccurately referred to as 'indigenous' in existing literature. This was an unanticipated finding, which was then further explored in the research, leading to original and significant insights. It was demonstrated that the knowledge contributing to reduced mortality rates amongst the Melanesian ethnic group was an amalgamation of knowledge from sources internal to the country (i.e. knowledge based on hazards experienced elsewhere in the country), as well as external (i.e. knowledge gained directly via video material, and indirectly via tourists who had watched news-items of the Indian Ocean Tsunami). None of this knowledge originated on Ghizo Island. Based on this it is argued that more attention should be paid to the context when labelling knowledge as 'indigenous'. For these reasons the term 'locally relevant knowledge' was introduced and used in this thesis, referring to

all knowledge aiding adequate reactions to locally occurring hazards. It also illustrates that knowledge globalised by public and popular media has the ability to influence hazard-related protective behaviour. This in turn shows the potential strength programmes or projects aimed at increasing hazard-awareness can have when adapting their strategies to locally popular practices, such as watching videos at community film evenings.

All of the above-mentioned insights and knowledge might not have been gained if it were not for the methodological approach used. The interdisciplinary nature of the research allowed the research approach and methods to be informed by and adapted to the local context. The preliminary field visit at an early stage greatly facilitated this. The methodological approach used was informed by ethnography, and indigenous and decolonising methods, as well as literature on Melanesian ethics. It is in this sense original, not only with regard to the ways it was developed, but also with regard to the specific combination of methods used.

8.5 Suggestions for further research

By detailing the contributions to knowledge, the above discussion identified a few main areas that would benefit from further research. It strongly underscores the argument that ethnicity is a factor of significant importance to consider in hazard and disaster research. Whereas the findings presented add to the limited literature of response and recovery in an ethnically diverse context in developing countries, this is still an area that could benefit from more research. In this light, more studies could look into 1) how different ethnic groups are affected by the same events, 2) the role a disaster can play in reducing or amplifying cultural differences between ethnically diverse groups, 3) ethnic groups' changing views of one another's cultural practices, and 4) the directions in which disaster subcultures develop. Comparative research (e.g. between different disasters or between different countries affected by the same disaster) could generate innovative insights into how these four suggested directions of research vary in different settings. As the scope of such research should be informed by the field setting in which it takes place, it is highly

likely that the research falls in the interstices among scientific disciplines. Interdisciplinary research may therefore be a suitable line of study.

Additionally, this research shows that studying how disaster-affected communities recover can provide important insights into the long-term impacts of aid interventions. It validates Bird et al.'s (2011) and Varda et al.'s (2009) claim that the study of disaster management processes can provide valuable information for designing and executing disaster management interventions. However, it also confirms that there are currently few studies addressing disaster management processes from this angle as the focus is often largely on assessing damage and losses (Birkmann 2010). These findings call for more research on disaster management processes with a focus on the long-term impacts of aid interventions on a community-level. Resilience should play a central role in such research, as aid interventions are not aimed at reducing resilience, yet they can have this effect if not carried out carefully and in a way that fails in paying attention to local cultural contexts.

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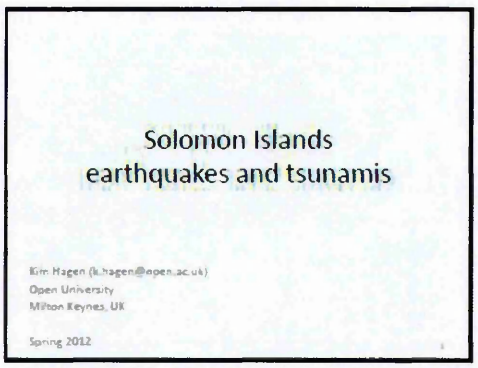
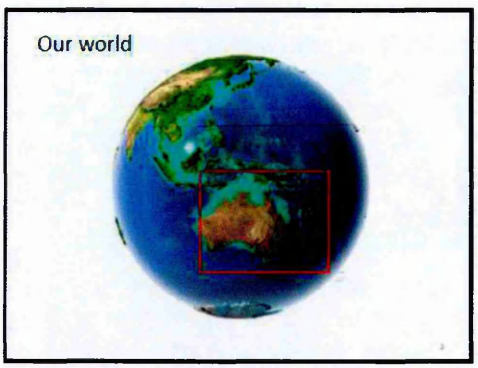
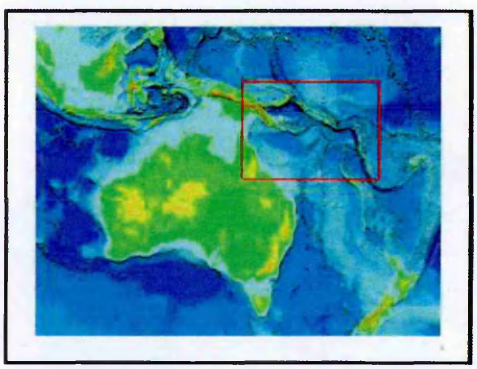
Annexes

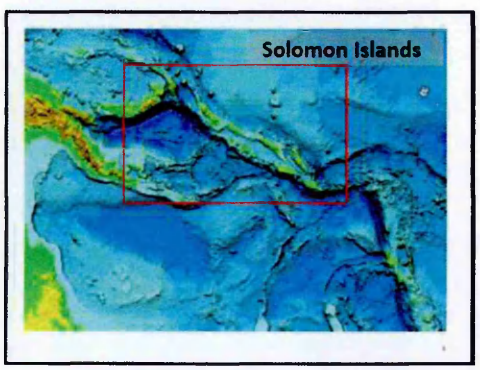
Annex 1: Presentations

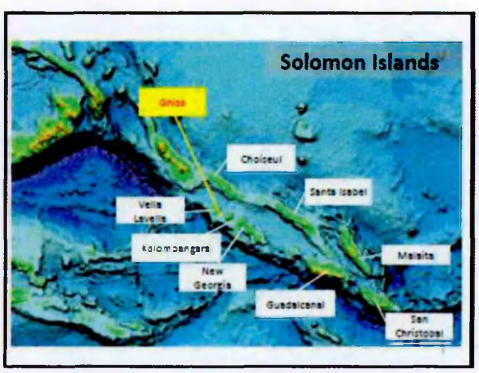
Presentation 1: Tectonic plates

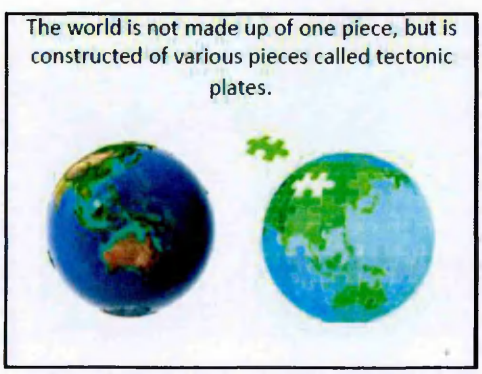




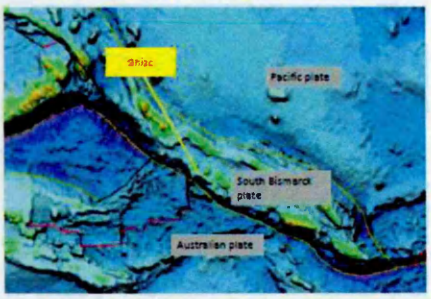




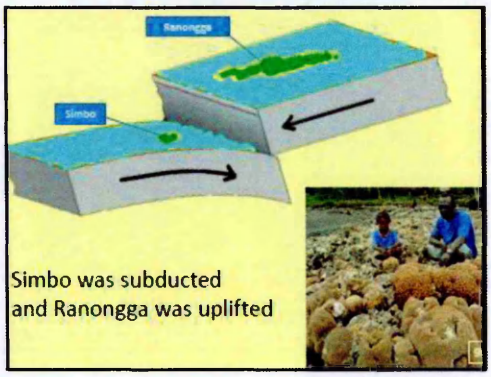




Tectonic plates of the Solomons

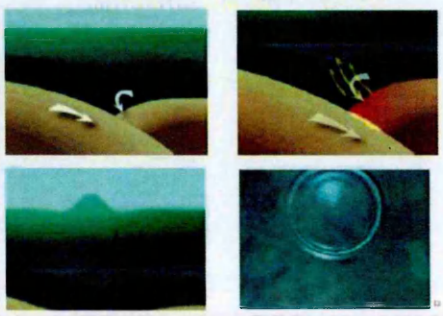


- Tectonic plates are constantly moving.
- In the Solomon Islands the plates move towards each other. The plates collide, and one plate slides below the other plate. This is called subduction.
- Subduction is a process that goes on for a long time. Meanwhile the pressure on the plates builds up.
- When the pressure gets too much the top plate breaks free and springs upwards. This causes an earthquake

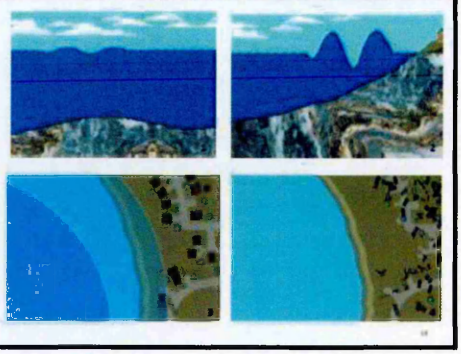


Simbo was subducted and Ranongga was uplifted

earthquake causing a tsunami



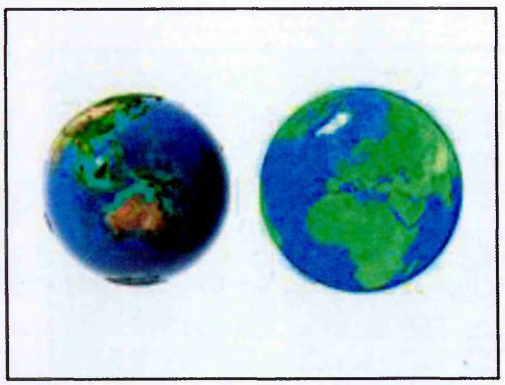
- When Ranongga's plate moved up, the water of the sea violently moved to the surface.
- This created the tsunami waves.
- Tsunami waves travel very fast. When they reach the coast they slow down, but they grow taller.

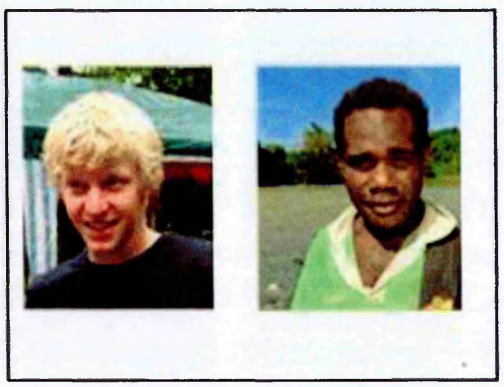


Sources:

- Pictures on slide 3, 4, 5, and 7
  http://nhb-arcims.si.edu/ThisDynamicPlanet/index.html
- Video on slide 11 and pictures on slide 12
  http://www.youtube.com/watch?v=qQ9Mw_rtDng
- Pictures on slide 14:
  http://www.pep.bc.ca/tsunamis/causes_2.htm

Presentation 2: Phenotypic differences





People with white skin often live in colder countries.

White skin has little melanin, because there is not much sun in cold countries.

People with dark skin often live in warm countries.

- Dark skin has more melanin. This makes the skin look dark and helps it protect from the sun

Because white skin does not have much melanin, people with white skin cannot spend much time in the sun, or have to use sunlotion to protect their skin from the sun. Otherwise they get a painful sunburn.

Long, narrow nose in cold climates to warm the cold air before it enters the body

Short nose in hot climates, because here you don't need to warm the air further before it enters your body

Annex 2: Interview schedule

March 2013

Mon	Tue	Wed	Thu	Fri	Sat	Sun
					2	3
4	5	6	7 Lorimo	8	9	10
11 Arthur Emma	12 Tirza Jean	13 Angela	14 Marie Anne	15 Hank Edison	16 Madelyn Anita	17
18 Mack Tom	19 Joelle	20 Peter Charles	21 Gabriel	22 Tilda	23	24
25	26 Rex	27 Andrew Ruthie	28	29	30	31